

Broughton Land Company

Draft Environmental Assessment and Native Fish Habitat Conservation Plan

Prepared by



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COVER SHEET
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Title of Environmental Review: Broughton Land Company Draft Environmental Assessment and Native Fish Habitat Conservation Plan

Evolutionarily Significant Units: Snake River Spring/Summer Chinook Salmon
Snake River Fall Chinook Salmon
Snake River Steelhead
Middle Columbia Steelhead

Distinct Population Segments: Coterminous U.S. bull trout

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Legal Mandate: Endangered Species Act of 1973, as amended and implemented – 50 CFR Part 223

Location of Proposed Activities: Washington, Columbia County

Activity Considered: NMFS' and FWS' action of issuing incidental take permits to the Broughton Land Company (BLC) under section 10(a)(1)(B) of the Endangered Species Act

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List of Acronyms and Terms

BLC	Broughton Land Company
Cfs	Cubic feet per second
CCC	Civilian Conservation Corps
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESU	Evolutionarily Significant Units
Ecology	Washington Department of Ecology
F	Fahrenheit
Forest Practice Rules	Washington Forest Practices Act Rules
HCP	Habitat conservation plan
ITP	Incidental take permit
Mi ²	Square miles
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
RM	River Mile
Services	U.S. Fish and Wildlife Service and the National Marine Fisheries Service
USDA	U.S. Department of Agriculture
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources

Chapter 1 Introduction

Broughton Land Company (BLC), a privately held company, has requested Endangered Species Act (ESA) Section 10(a)(1)(B) permits (Section 10 permits) from both the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) (collectively the “Services”). The purpose of this Environmental Assessment (EA) is to analyze the environmental impacts of the Services’ issuing and implementing a Section 10 permit under the National Environmental Policy Act (NEPA). BLC owns and manages approximately 38,000 acres of range, agricultural, and forestland in Columbia County, Washington. To date, BLC’s management practices have not been seriously constrained by restrictions imposed under the ESA. However, given the existence or likely existence of species federally listed as “threatened” on BLC’s lands, BLC has engaged the Services in conservation planning efforts on the entirety of its ownership.

The proposed Native Fish Habitat Conservation Plan (HCP) (Chapters 3 and 4, plus appendices) and the EA (Chapters 1, 2, 5-10) have been prepared with the assistance of the Services, and are intended to satisfy the requirements for a Section 10 permit and the National Environmental Policy Act (NEPA). The proposed HCP covers several activities under BLC’s farming (section 3.3.3.3), grazing (section 3.3.3.2), and forestry operations (section 3.3.3.1). The species proposed for coverage in the HCP are Snake River spring/summer Chinook salmon and Snake River fall Chinook salmon (both *Oncorhynchus tshawytscha*), middle Columbia River steelhead trout and Snake River steelhead trout (both *Oncorhynchus mykiss*), and bull trout (*Salvelinus confluentus*) (these species are referred to as the “covered species”). The five covered species are all listed as threatened; salmon and steelhead are under the jurisdiction of NMFS, and bull trout are under the jurisdiction of the FWS. The duration of the HCP is proposed for 25 years. Upon the determination that the HCP meets the ESA Section 10 issuance criteria, each agency would issue an Incidental Take Permit (ITP) for the species it manages (for simplicity, this EA/HCP refers to the multiple ITPs as “the” or “an” ITP). The ITP would minimize regulatory uncertainty for BLC and provide it with the continued ability to manage its lands for food and fiber that is essential to BLC and to the economic health of communities in Columbia County and its neighboring rural counties.

Chapter 2 Purpose and Need for Action

2.1 Purpose and Need for Broughton Land Company

BLC's business is of a long-term nature, and a stable operating and regulatory environment is critical. BLC requires regulatory certainty as well as stability and views this HCP as a vehicle for obtaining these conditions.

While BLC controls or owns only a very small part of the habitat available or used by the species covered under the proposed action, implementing the HCP's mitigation measures would help relieve stresses on the fish species during critical spawning and rearing times. These stressors include increases in water temperature, sediment delivered to the stream which remains as part of the stream bed load, excessive nutrients and resultant undesirable aquatic plant growth, the instability of stream banks, the potential for mass failure of upland slopes, and pump intakes that are not properly screened.

The HCP as proposed is designed to address these issues and limit their impacts on the covered aquatic species that may use streams flowing through BLC's lands. Thus, over time, the purposes of this HCP are threefold:

- To improve stream channels, riparian zones, and the health of the covered fish species as a result of BLC conservation practices, including livestock management, fencing riparian areas, planting buffers, farming tillage practices that minimize erosion and sediment delivery to water courses, sustainable forestry, and road maintenance and abandonment.
- To yield a net benefit to a wide range of listed or sensitive fish and other wildlife species.
- To ensure long-term sustainable management of BLC lands, yielding positive results for the company and for the communities dependent upon BLC for jobs and economic health.

2.2 Purpose and Need for the Services

The purpose of this action, which is to implement the HCP and to issue an ITP for 25 years, is to conserve listed and unlisted species and their habitats and to ensure compliance with the ESA and other federal laws and regulations. The need for this action is to assist BLC with regulatory compliance under the ESA while conserving listed species and to develop a cooperative plan between the Services and BLC for this conservation.

2.3 Decisions to be Made

Within the context of the Purpose and Need for the action, the proposed HCP would set forth conservation practices that would allow the Services to make the following decisions regarding the issuance of a Section 10 incidental take permit. These questions must be answered

affirmatively for the responsible Services to grant an ITP under Section (10)(a)(1)(B) of the ESA.

- Is the proposed take incidental to an otherwise lawful activity?
- Are the impacts of the proposed take minimized and mitigated to the maximum extent practicable?
- Has the applicant ensured that adequate funding would be provided to implement the measures proposed in the HCP?
- Is the proposed take such that it would not appreciably reduce the likelihood of the survival and recovery of the species in the wild?
- Are there any other measures that should be required as a condition of the permit?

If the measures included in the proposed HCP meet these criteria, the Services would issue the ITP for the species and land management activities covered in the HCP.

2.4 NEPA Responsibilities

The National Environmental Policy Act (NEPA) requires federal agencies to evaluate and disclose the effects of their proposed actions on the human environment in a written statement as either an Environmental Impact Statement (EIS) or an Environmental Assessment (EA). An EA is a concise public document that briefly discusses the need for alternatives to an action and provides sufficient evidence and analysis to support a determination of no significant impacts or a determination to prepare an EIS. With respect to HCPs in general, compliance with NEPA is not a direct obligation or requirement of the applicant for the Section 10 permit. However, the Services must comply with NEPA when making their decisions on the application and implementing the federal action of issuing an ITP. Consequently, the appropriate environmental analyses must be conducted and documented before a Section 10 permit can be issued. The Services have determined that an EA is initially appropriate for this action to determine if there will be significant impacts to the environment.

This document contains both the NEPA EA (Chapters 1, 2, 5-10) and the proposed HCP (Chapters 3 and 4, plus appendices) in support of an application for an ITP. The preparation of this document follows the guidelines in the Endangered Species Habitat Conservation Planning Handbook (USFWS 1996) and Addendum (65 FR 35242-35257), the Council on Environmental Quality NEPA Regulations (40 C.F.R. 1500), and the Services' NEPA implementing procedures.

Under the Services' NEPA implementing procedures, public scoping is not required to prepare an EA, however the Services conducted internal scoping and identified the following as likely concerns about the proposed action:

- Impacts of BLC's operations on native fish and their habitat, including through sedimentation which affects water quality, and through loss or gain of riparian and aquatic habitats and stream channel conditions.
- Local economic impacts from BLC's operation as modified by the HCP,
- Potential impacts to cultural and historic resources, and
- Potential cumulative impacts.

Resources that will not be impacted, and therefore are not addressed in this EA include:

- Recreation - BLC's response to recreational use of their land by the public would not be affected by any of the alternatives.
- Upland Vegetation and Native Plants - none of the alternatives propose changes in BLC's actions that would affect vegetation and native plants outside of riparian zones.
- Aesthetics, Wildlife, Birds, and Amphibians - none of the alternatives propose changes in BLC's actions that would affect aesthetics, wildlife, birds, or amphibians.

2.5 RELATIONSHIP TO OTHER PLANS, POLICIES, AND LAWS

Many Federal, state, and local regulations and policies govern salmonid conservation in the Columbia River Basin. The primary laws, regulations, and plans that affect development and implementation of an HCP, ITP, and the proposed activities are summarized below to assist the reviewer by adding additional context for the BLC HCP.

Endangered Species Act

The Endangered Species Act (ESA) is intended to protect and conserve species listed as threatened or endangered and to conserve the habitats upon which they depend. Furthermore, the ESA mandates that all Federal agencies seek to conserve endangered and threatened species and use their resources and authorities to further such purposes. The ESA and implementing regulations (16 USC 1531 et seq., 50 CFR Parts 17, 222, and 402) make it unlawful to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any federally listed threatened or endangered species. The ESA and implementing regulations are applicable to activities in the proposed action alternative that could affect federally listed threatened or endangered species that may be present within BLC's property and Columbia County, Washington. Such species may include Snake River spring/summer and fall Chinook salmon, middle Columbia River and Snake River steelhead trout, and bull trout. The FWS and NMFS administer the ESA, and Section 10 of the ESA allows the Services to issue incidental take permits that authorize the take of listed species by non-Federal entities. The Services define "incidental take" as take that is "incidental to, and not the purpose of, carrying out an otherwise lawful activity." To obtain an incidental take permit, an applicant must submit an HCP and have the permit issuance criteria met before approval is given by the FWS, NMFS, or both agencies, as appropriate. Issuance of incidental take permits under ESA Section 10(a)(1)(B) is a Federal action subject to National Environmental Policy Act compliance.

ESA Section 7(a)(2) provides that Federal agencies shall consult with the Services to ensure any action authorized, funded, or carried out by such agency (i.e., action agencies) is not likely to jeopardize the continued existence of any endangered or threatened species or result in the adverse modification or destruction of designated critical habitat. Service actions under ESA Section 10(a)(1)(B) are Federal actions. Because the Services are the action agencies, they must consult with themselves to ensure the decisions made will not jeopardize any listed species (not just those addressed in the HCP) or adversely modify or destroy critical habitat. The results of these consultations are documented in biological opinions developed by the Services for the species under their jurisdiction. Biological opinions are produced near the end of the process and document conclusions regarding the likelihood of jeopardizing the continued existence of any listed species or adversely modifying designated critical habitat for any listed species.

ESA Recovery Planning

ESA Section 4(f) requires the Services to develop and implement recovery plans for the conservation and survival of listed salmonid species. Recovery plans must describe specific management actions, establish objectives and measurable criteria for delisting, and estimate the time and cost to carry out measures needed to achieve recovery. NMFS has developed a strategy for salmon recovery planning in Washington, Idaho, Oregon, and California that combines ESA-listed salmonid and steelhead distinct population segments into specific geographic areas. The Northwest Region has three recovery areas, or recovery domains, and has established technical recovery teams of scientists for each domain. Recovery plans for each domain are intended to address all salmonid species within that geographic area and to involve stakeholders at a local level. NMFS is currently preparing recovery plans for each domain. The project area is partially within the Interior Columbia Recovery Domain, which consists of three subbasins: Upper Columbia, Middle Columbia, and Snake River. Additional information about the Interior Columbia River Domain can be obtained at: www.nwr.noaa.gov/Important-Policies-Links.cfm . Click on the “Salmon Recovery Planning” header.

The Fish and Wildlife Service has developed a draft recovery plan for the bull trout (FWS, 2002a, 2002b, 2002c, 2004). Different chapters of the draft plan address different watersheds and draft recovery units. The BLC HCP has parcels within the Umatilla-Walla Walla Recovery Unit (chapter 10) and the Snake River Recovery Unit (chapter 24).

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 ([42 USC 4321 et seq.](#)) requires that Federal agency decision-makers, in carrying out their duties, use all practicable means to create and maintain conditions under which people and nature can exist in productive harmony and fulfill the social, economic, and other needs of present and future generations of Americans. NEPA provides a mandate and a framework for Federal agencies to consider all reasonably foreseeable environmental effects of their proposed actions and to involve and inform the public in the decision-making process. This Act also established the Council on Environmental Quality (CEQ) in the Executive Office of the President to formulate and recommend national policies which ensure that the programs of the Federal government promote improvement of the quality of the environment. The CEQ set forth regulations ([40 CFR Parts 1500-1508](#)) to assist Federal agencies in implementing NEPA during the planning phases of any Federal action. These

regulations together with specific Federal agency NEPA implementation procedures help to ensure that the environmental impacts of any proposed decisions are fully considered and that appropriate steps are taken to mitigate potential environmental impacts. Although NEPA requirements include an analysis of impacts to the same species as does the ESA, the scope of NEPA goes beyond that of the ESA by considering the impacts of a Federal action not only on fish and wildlife resources, but also on non-wildlife resources of the human environment such as water quality, cultural resources, and socioeconomic values.

National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. 470 *et seq.*), requires Federal agencies to take into account the effects of their actions proposed on properties eligible for inclusion in the National Register of Historic Places. “Properties” are defined herein as “cultural resources”, which includes prehistoric and historic sites, buildings, and structures that are listed on or eligible to the National Register of Historic Places. An undertaking is defined as a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; those requiring a Federal permit, license or approval; and those subject to state or local regulation administered pursuant to a delegation or approval by a Federal agency. The issuance of an incidental take permit is an undertaking subject to Section 106 of the NHPA. The Service has determined that the area of potential effect for the present undertaking is that area where on-the-ground project activities will result in take of species.

Secretarial Order 3206

Secretarial Order 3206 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), issued by the Secretaries of Interior and Commerce, clarifies the responsibilities of the component agencies, bureaus, and offices of the Departments of Interior and Commerce when actions taken under ESA and its implementing regulations affect, or may affect, Indian lands, tribal trust resources, or the exercise of American Indian tribal rights. Secretarial Order 3206 acknowledges the trust responsibility and treaty obligations of the United States toward Indian tribes and tribal members, as well as its government-to-government relationship with tribes. The order requires the Service to carry out its ESA responsibilities in a manner that harmonizes the Federal trust responsibility to tribes, tribal sovereignty, and statutory missions of the Departments, and that strives to ensure that Indian tribes do not bear a disproportionate burden for the conservation of listed species to avoid or minimize the potential for conflict and confrontation. Consultation efforts with the tribes are described in Chapter 10.

Clean Water Act

The Clean Water Act (33 USC 1251, 1977, as amended in 1987), administered by the U.S. Environmental Protection Agency and state water quality agencies, is the principal Federal legislation directed at protecting water quality. Each state implements and carries forth Federal provisions, as well as approves and reviews National Pollutant Discharge Elimination System applications, and establishes total maximum daily loads for rivers, lakes, and streams. The states are responsible for setting the water quality standards needed to support all beneficial uses, including protection of public health, recreational activities, aquatic life, and water supplies.

The Washington State Water Pollution Control Act, codified as Revised Code of Washington Chapter 90.48, designates the Washington Department of Ecology (Ecology) as the agency responsible for carrying out the provisions of the Federal Clean Water Act within Washington State. Ecology is responsible for establishing water quality standards, making and enforcing water quality rules, and operating waste discharge permit programs. These regulations are described in Washington Administrative Code 173.

Magnuson-Stevens Act

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (Public Law 94-265) is the principal law governing marine fisheries in the United States. It was adopted to extend control of U.S. marine waters to 200 nautical miles beyond the U.S. coastline, to phase out foreign fishing within this zone, to prevent over-fishing, to allow over-fished stocks to recover, and to conserve and manage fishery resources. Under the Magnuson-Stevens Act, conservation and management measures are intended to prevent over-fishing while achieving optimum yield. In addition, the importance of fishery resources to fishing communities mandates that this be taken into account in fishery management decisions and these decisions should provide for the sustained participation of, and minimization of adverse impacts to such communities (consistent with conservation requirements).

Washington Forest Practices Act

In 1974 the Washington state legislature wrote the Forest Practices Act, Chapter 76.09 of the Revised Code of Washington (RCW). The Act defines a plan to protect public resources while assuring that Washington continues to be a productive timber growing area. The Forest Practices Rules, Title 222 of the Washington Administrative Code (WAC) give direction on how to implement the Forest Practices Act, and Stewardship of Non-industrial Forests and Woodlands (Chapter 76.13 RCW).

The Forests and Fish Act, passed by the Legislature and signed by Governor Locke in 1999, directed the Forest Practices Board to adopt the Forests and Fish Report into the State Forest Practices Rules. The rules establish for Washington State the greatest level of protection for forested streams in the United States. The Forests and Fish Act was developed into a programmatic, statewide plan Habitat Conservation Plan that covers 60,000 miles of streams running through 9.3 million acres of forestland. The HCP is a 50-year agreement with the federal government for protection of Washington's streams and forests that provide habitat for more than 70 aquatic species, including salmon, many of them threatened or endangered.

Forest practice activities on BLC's ownership are governed by current Forest Practices Rules and the Forests and Fish HCP. The location and methods for timber harvest is defined by these rules. The BLC also typically grazes cattle on some of its forested lands; grazing is not addressed in the Washington Forest Practices Rules.

The WDNR Forest Practices Regulatory Program regulates forest practices in the State, including forest practices affecting cultural resources on private lands (Washington Administrative Code [WAC] 222). In addition to the forest practices regulations, the Cultural Resource Protection and Management Plan, written and agreed upon by the Timber, Fish and Wildlife Cultural Resource Committee participants on July 3, 2003, provides a process to

enhance protection, of cultural and archaeological sites on managed forestlands (Timber, Fish, and Wildlife Cultural Resources Committee 2003).

Washington Water Law

Water use in Washington State is regulated through a state permit and certificate system (Chapter 90 Revised Code of Washington). The Department of Ecology's Water Resources Program will work to ensure voluntary compliance with state water law. A water right permit or certificate is required for all uses of surface water (lakes, ponds, rivers, streams, or springs) since the Surface Water Code was enacted in 1917. A water right permit or certificate is also required for non-exempt ground water withdrawals that began after the adoption of the Ground Water Code in 1945.

Hydraulic Project Approval

Under the Hydraulic Code (Chapter 77.55 Revised Code of Washington), a Hydraulic Project Approval permit (HPA) from Washington Department of Fish and Wildlife (WDFW) is required for any construction activity in or near State waters. An HPA is also required for the performance of other work that will use, divert, obstruct, or change the natural flow or bed of any waters of the State. An HPA allows the WDFW to condition such construction or work activity to protect fish and their habitats.

State Endangered, Threatened, and Sensitive Species Acts

The state of Washington has species of concern listings (Washington Administrative Code Chapters 232-12-014 and 232-12-011) that include all state endangered, threatened, sensitive, and candidate species. State Monitor species are not considered Species of Concern, but are monitored for status and distribution. These latter species are managed by WDFW, as needed, to prevent them from becoming endangered, threatened, or sensitive. The state list is separate from the Federal ESA list; the state list includes species status relative to Washington state jurisdiction only. Critical wildlife habits associated with state or Federally listed species are identified in Washington Administrative Code Chapter 222-16-080.

Subbasin Planning

The following information was found in the Northwest Power and Conservation Council (NWPCC) website: <http://www.nwcouncil.org/fw/subbasinplanning/Default.htm>. In 2005 the Northwest Power and Conservation Council completed one of the largest locally led watershed planning efforts of its kind in the United States, an effort that resulted in separate plans for 58 tributary watersheds or mainstem segments of the Columbia River. These subbasin plans were developed collaboratively by state and federal fish and wildlife agencies, Indian tribes, local planning groups, fish recovery boards, and Canadian entities where the plans address transboundary rivers. The planning effort was guided by the Council and funded by the Bonneville Power Administration.

Subbasin plans identify priority restoration and protection strategies for habitat and fish and wildlife populations in the United States portion of the Columbia River system. The plans will guide the future implementation of the Council's Columbia River Basin Fish and Wildlife Program, which directs more than \$140 million per year of Bonneville electricity revenues to protect, mitigate and enhance fish and wildlife affected by hydropower dams. Subbasin plans

will provide this guidance by providing the context in which proposed projects are reviewed for funding through the Council's program.

Subbasin plans also integrate strategies and actions funded by others, thus ensuring that each plan serves the Council's purposes under the Northwest Power Act and also accounts for Endangered Species Act and Clean Water Act requirements, and other laws governing natural resource management, as fully as possible.

The BLC HCP has parcels within the area of the Walla Walla Subbasin Plan and the Tucannon Subbasin Plan.

Farm Bill and Conservation Programs

The Farm Security and Rural Investment Act of 2002 (Farm Bill), signed into law on May 13, 2002, governs Federal farm programs until 2008. Its provisions support the production of a reliable, safe, and affordable supply of food and fiber; promote stewardship of agricultural land and water resources including conservation land retirement programs, and emphasize on-farm environmental practices; and encourage continued economic and infrastructure development in rural America. In Columbia County and other parts of Washington State many farmers take advantage of existing Farm Bill and other conservation programs. Two programs of importance are: the Conservation Reserve Program (CRP), and Conservation Reserve Enhancement Program (CREP).

Conservation Reserve Program (CRP) requires an equitable balance among conservation purposes of soil erosion control, water quality protection, and wildlife habitat. The CRP is administered by the Farm Service Agency, with NRCS providing technical land eligibility determinations, conservation planning and practice implementation. The CRP reduces soil erosion, protects the Nation's ability to produce food and fiber, reduces sedimentation in streams and lakes, improves water quality, establishes wildlife habitat, and enhances forest and wetland resources. It encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filterstrips, or riparian buffers. CRP offers annual rental payments and cost-share assistance to farmers to establish long-term conserving covers (e.g., grass and trees) on eligible lands. Cost sharing is provided to establish the vegetative cover practices. Contracts are for a minimum of 10 years and a maximum of 15 years. More information can be found at: <http://www.nrcs.usda.gov/programs/crp/>.

The CREP is a joint partnership between the State of Washington and USDA, and is administered by the Washington State Conservation Commission and the Farm Services Agency (FSA). The agreement was signed in 1998 and provides incentives to restore and improve salmon and steelhead habitat on private land. The program is voluntary for landowners. Land enrolled in CREP is removed from production and grazing under 10- or 15-year contracts, and landowners plant trees and shrubs to stabilize the stream bank. These plantings also provide a number of additional ecological functions. In return, landowners receive annual rent, incentive and maintenance payments, and cost share for practice installations. These payments made by FSA and the Conservation Commission may result in no cost to the landowner for installation of

qualified practices. Acres enrolled under CREP count toward the overall CRP acreage cap. More information can be found at: <http://www.scc.wa.gov/programs/crep/>.

Chapter 3 The Broughton Land Company HCP (The Proposed Action Alternative)

3.1 Overview

Chapters 3 and 4, plus appendices, comprise the HCP, and were developed and written by BLC.

State and local rules and guidelines currently regulate BLC's farming, grazing, and forestry enterprises. Currently, BLC's smaller ownership and careful land management practices incur very little total impact on the covered species. However, BLC desires to make changes that would be beneficial to the species, while striving to maintain operational efficiency. Therefore, the proposed HCP was developed with two objectives: (1) minimize impacts to the covered aquatic species and conserve them on BLC's property, and (2) assure conservation and mitigation practices are reasonable from a direct financial and an operational standpoint.

3.2 Regulatory Framework

BLC proposes that the HCP cover three aquatic species: chinook salmon (*Oncorhynchus tshawytscha*), steelhead trout (*Oncorhynchus mykiss*), and the Columbia River Distinct Population Segment of bull trout (*Salvelinus confluentus*). Each of these species is currently listed as "threatened" under the ESA, and was listed in these years: Snake River ESU spring/summer and fall chinook salmon, 1992; Snake River ESU steelhead trout, August, 1997; bull trout, in 1998.

When an animal species is listed by USFWS, the ESA prohibits any "taking" of the species without a permit. As defined in the ESA, "take" means: "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (Section 3 [19]). Definitions of "harass" and "harm" are not included in the ESA's statutory language, but are provided in federal regulations. "Harass" means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3). "Harm" means an act that actually kills or injures wildlife. Such acts may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR 17.3).

In 1982, recognizing that take of listed species cannot always be avoided, Congress amended the ESA to add Section 10 to the ESA. That amendment included provisions for the issuance of permits which would allow the taking of listed species that are incidental to, but not the purpose of, otherwise lawful activities. An application for a Section 10 (a) incidental take permit must be accompanied by an HCP that adheres to federal regulations and guidelines prepared by USFWS. An application for a Section 10(a) incidental take permit must be submitted on an official form (Form 3-200) and be accompanied by the following attachments:

1. A complete description of the activity for which the permit is being sought.
2. The common and scientific names of the species to be covered by the permit.
3. A habitat conservation plan that specifies:
 - The impact that would likely result from the proposed taking of the species;
 - Steps the applicant would take to monitor, minimize, and mitigate such impacts;
 - The level and source of funding available to implement such steps;
 - Procedures that would be used to deal with unforeseen circumstances;
 - The names of the responsible party or parties;
 - Alternatives to the taking and the reasons why they were not pursued; and
 - Other measures required by USFWS as necessary or appropriate.

The application is submitted to the USFWS, which, after a public comment period, must issue the permit if it is found that:

- The take will be incidental;
- The applicant will, to the maximum extent practicable, minimize and mitigate the impacts of the take;
- The applicant will ensure that adequate funding for the plan will be provided;
- The take will not appreciably reduce the likelihood of the survival and recovery of the species in the wild; and
- Other measures required by USFWS will be met.

Section 7 of the ESA requires all federal agencies to consult with USFWS or NMFS regarding any federal action that may affect a federally listed species. This requirement applies to all federal land management decisions and actions, as well as federally funded actions on non-federal lands. Such consultations require preparation of a biological evaluation or assessment by the federal action agency.

The biological opinion for a federal action affecting a listed species is required to determine whether the proposed federal action is likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of any area that has been designated as “critical habitat.” In addition, the agencies make a determination as to whether the proposed federal action is consistent with the goals established by any recovery plan that may have been adopted for any listed species in the area affected by the federal action. Federal actions that require consultation pursuant to Section 7 include the issuance of Section 10(a) permits. Thus, prior to issuance of the permit requested by BLC, the agencies will prepare an internal biological opinion that will analyze the effects of the issuance of permits on the species to be covered by the permit.

“No surprises” assurances are provided by the appropriate agencies through the provisions of 10(a)(1)(B) process to non-federal landowners. Essentially, private landowners are assured that if “unforeseen circumstances” arise, the agencies would not require the commitment of additional land, water, or financial resources, or additionally restrict the use of the land beyond

those originally agreed upon through the HCP, unless the landowner consents. The federal government will honor these assurances as long as the HCP permit holder continues to implement the terms and conditions of the HCP, the permit and the other associated documents in good faith. In effect, these regulations state that the government will honor its commitment so long and the landowners honor those that are set forth in the HCP. The “no surprises” policy is further described in the Federal Register, 63(35): 8859-8873 and in CFR 17.22 and 17.32 (Service regulations) and in CFR 222.22 (NMFS regulations).

Criteria for approval of HCP’s, as stated in the ESA and the HCP Handbook (USFWS 1996), ensure that approved HCP’s are consistent with recovery goals. Specifically, the ESA indicates that an approved HCP must demonstrate that the permitted acts “will not appreciably reduce the likelihood of the survival and recovery of the species in the wild” (ESA, Section 10(a)(2)(B)(iv)). This statement is further clarified in the HCP Handbook, which states that an HCP is not a recovery plan, but rather a mechanism for allowing economic development that will not “appreciably reduce the likelihood of the survival and recovery of the species in the wild” (USFWS 1996). Therefore, even though some species do not have an approved or current recovery plan (as is the case for the species in the BLC HCP), an approved habitat conservation plan is still possible, which ideally will contribute toward the recovery of listed species.

3.2.1 Compliance with the National Historic Preservation Act

Projects such as habitat conservation plans that result in a federal decision (in this case an “incidental take permit”) are required to show compliance with the National Historic Preservation Act (NHPA). The essence of this statute is to identify and protect important prehistoric, historic, and cultural resources from federal actions that might threaten their integrity. Even though BLC is a private company operating solely on private lands, the terms of the Act apply to the granting of the permit by the regulatory agencies.

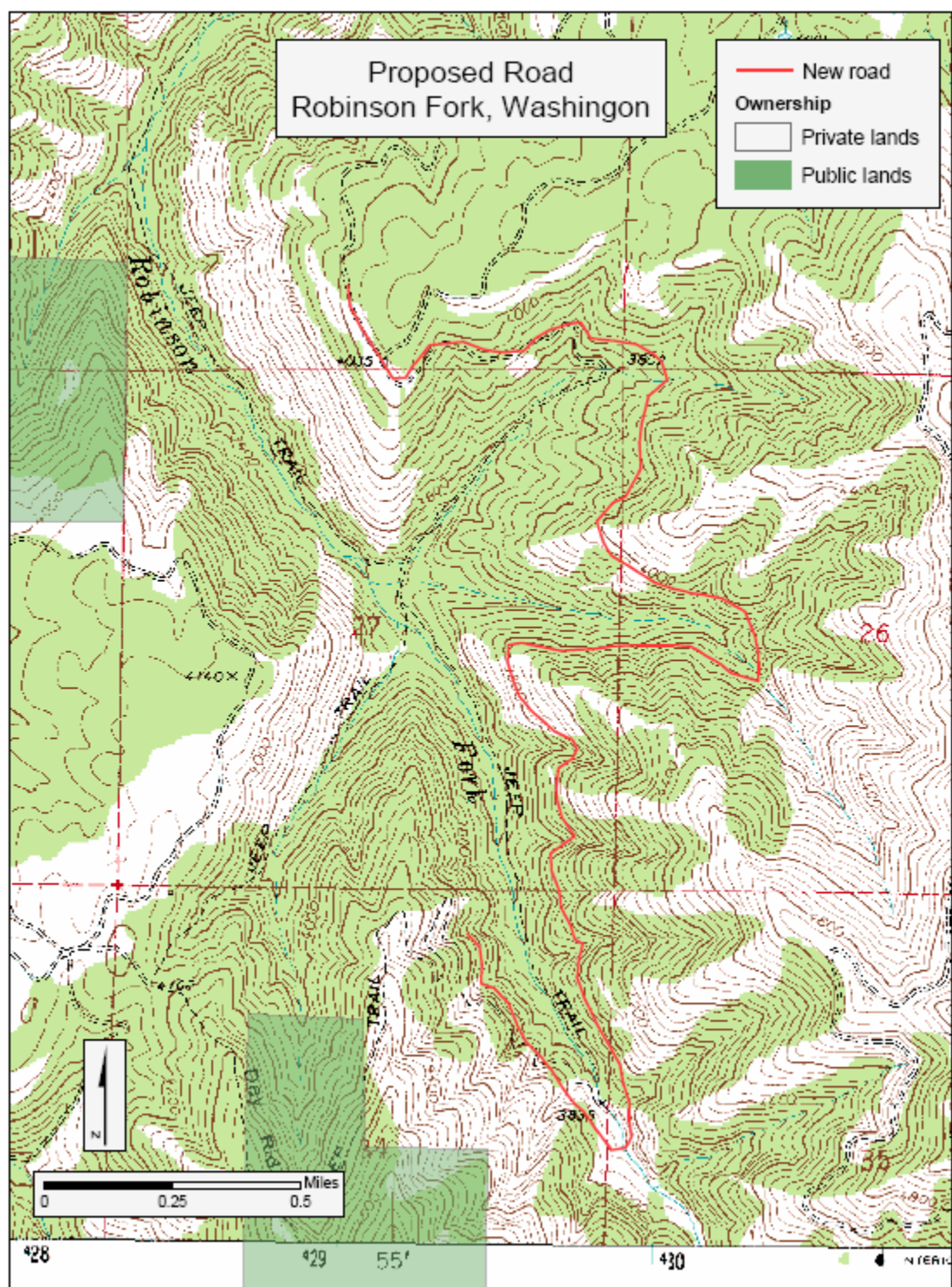
The history of the Native Americans and European settlement beginning with Lewis and Clark’s sojourn through the area in 1806 virtually assures a rich historic and cultural legacy. In fact, the company recently donated lands where the Lewis and Clark expedition camped, and the local historical society maintains an interpretive site on that location. However, despite the undoubtedly rich history, Broughton’s manager reports that there are few known existing historical sites within the company’s ownership. This is probably a function of such natural occurrences as fires, heavy snowfalls and floods, and the fact that the area has been actively farmed for at least a century. For example, there reportedly was a logging camp and a logging flume in Robinson Fork that operated in the early 1900’s, but there are now no traces of either.

The lack of visible physical remains that might have cultural or historic significance does not negate the need for compliance with the Act, however. Perhaps the land use activity that would have the greatest potential to uncover heretofore unknown artifacts or other historic or culturally significant remains would be excavations in new areas. The vast majority of Broughton’s property has been farmed for many years, and consequently the earth has been disturbed on a regular basis. Such areas hold little potential for new discoveries of historic or cultural sites. BLC does plan new logging roads in the southernmost portion of the Robinson Fork drainage. In the near term, this would include approximately 1 mile of permanent new road (see Figure 1) and

accompanying skid trails needed for logging. The addition to the permanent road system would require significant excavation, with a road prism that is approximately 16-feet wide at the base. Skid trails will involve considerably less earthmoving, generally limited to a blade width, and only where necessary to allow crawler tractors or rubber-tired skidders to bring logs to the decks where they are loaded on trucks.

BLC's efforts to comply with NHPA include working with archaeologists from the FWS to survey the area indicated in Figure 1 where the new roads would be constructed. These surveys may be completed either by actual site visits and physical surveys or by examination of aerial photos or through other remote sensing techniques. That decision would rest with the agency personnel. Broughton's responsibility shall be to notify the agencies at least 60 days prior to the initiation of either the new roads in Robinson Fork or any other currently unanticipated excavation of areas previously not disturbed and where the excavation exceeds either ten feet in width or covers more than one-half acre. In addition, if BLC's operations uncover what the company personnel view as a relic or site of potential historic or cultural significance, BLC will take immediate steps to protect the site and work with the appropriate state and federal agencies to protect these cultural resources. These steps would include a cessation of any excavations or ground disturbing activities until appropriate officials have viewed the site and made a determination on future actions.

Figure 1. Likely Area of New Road Impacts in Robinson Fork



3.3 Scope of the BLC HCP

3.3.1 Covered Species

The species sought for coverage through this plan are listed in Table 1. Although not specifically included in this HCP, additional fish and aquatic/riparian-dependent amphibian species of some concern that are known to occur, or that may occur, in Columbia County within, downstream, or upstream of BLC lands are also expected to benefit from the HCP conservation measures. At this time, BLC is not seeking to cover these species through the HCP. These species are listed in Table 2. Finally, there are numerous other species of fish and wildlife that are common and, therefore, not classified as a candidate species for listing as “endangered” or “threatened” or even as a species of concern according to federal or state agencies. It is not likely that any of the conservation practices in this HCP would harm any species. In fact, as described in the environmental analysis, the conservation practices would benefit all aquatic and riparian species, regardless of the commonality of their occurrence within Broughton’s ownership.

Table 1. Native Fish Species to be Covered by the HCP

Species	Federal Status	State Status
<i>Oncorhynchus tshawytscha</i>		
Snake River spring/summer Chinook salmon	FT	SC
Snake River fall Chinook salmon	FT	SC
<i>Oncorhynchus mykiss</i>		
Snake River Steelhead trout	FT	SC
Middle Columbia River Steelhead trout	FT	SC
<i>Salvelinus confluentus</i>		
Bull trout	FT	SC

Table 2. Aquatic and Riparian “Species of Concern” Benefited by the HCP

Species	Federal Status	State Status
Margined sculpin (<i>Cottus marginatus</i>)	FSC	SS
Tailed frog (<i>Ascaphus truei</i>)	FSC	--
River lamprey (<i>Lampetra ayresi</i>)	FSC	SC
Pacific lamprey (<i>Lampetra tridentata</i>)	FSC	--
Interior redband trout (<i>Oncorhynchus mykiss gairdneri</i>)	FSC	--

Federal Status Codes:

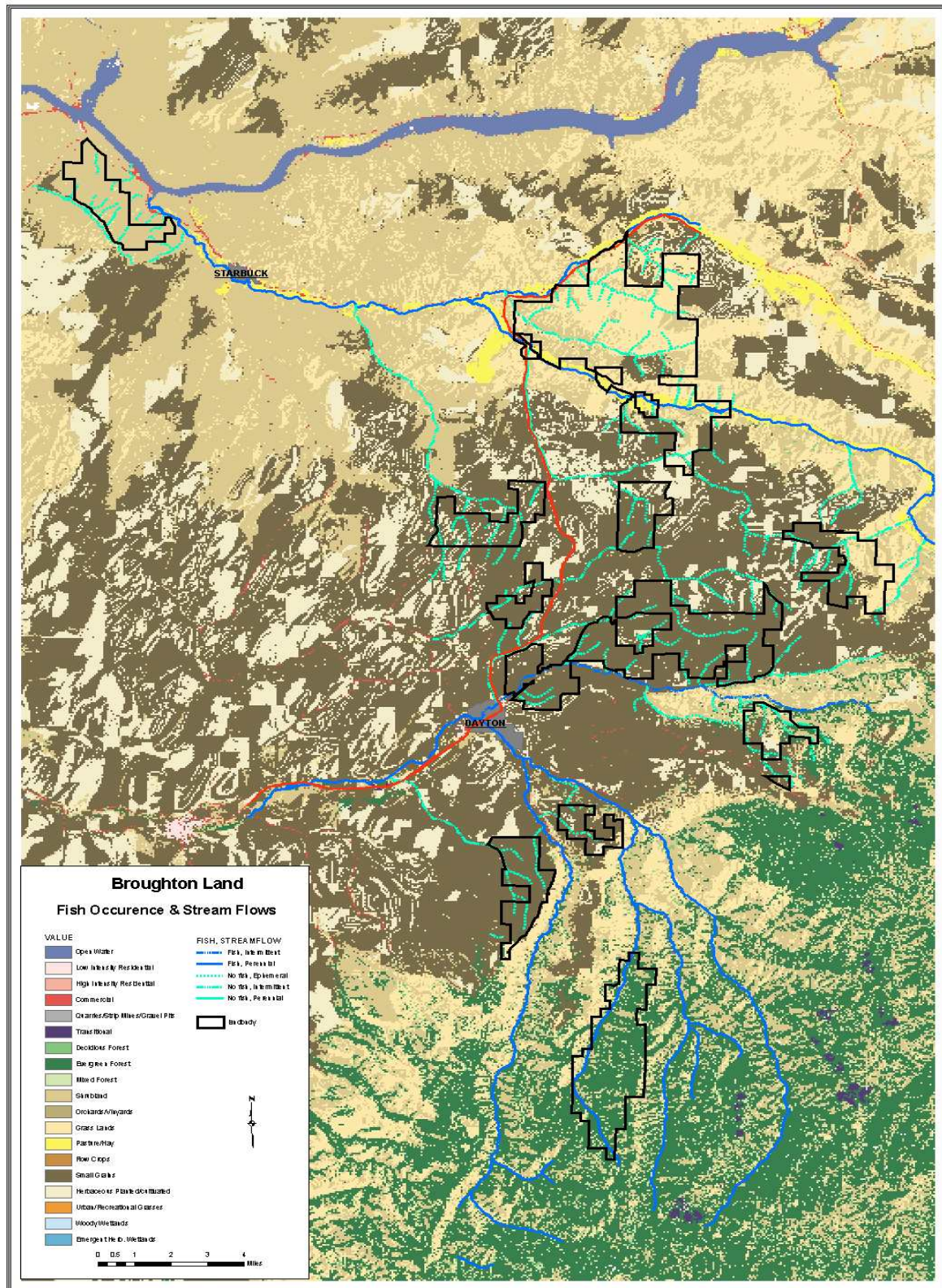
FE - Federally Endangered
 FT - Federally Threatened
 FC - Federal Candidate
 FSC - Federal Species of Concern

State Status Codes:

SE - State Endangered
 ST - State Threatened
 SC - State Candidate
 SS - State Sensitive
 SG - State Game Species of Concern

Some portions or all of the stream reaches within BLC's ownership are habitat for these species. Section 6.3 of the EA/HCP describes the historic and current distribution and population status of the species addressed by this HCP within the streams of Columbia County bordered, downstream, or upstream of BLC ownership. Current known distribution of fish species addressed by this plan is illustrated in Figure 2.

Figure 2. Fish Occurrence and Stream Classes Associated with the BLC Lands



3.3.2 *Term*

The HCP has a term expiring 25 years from the effective date of the incidental take permit granted pursuant to this HCP and may be renewed at the end of the term and at the option of the parties to the HCP. All species in Table 5 are to be covered for the full-term of the plan. Various parts of the HCP and the implementing processes describe the circumstances and manner in which this HCP might be amended or terminated before the expiration date.

3.3.3 **Covered Activities**

3.3.3.1 **Forest Management**

Forest management activities covered by this plan include all aspects of mechanized timber harvesting, log transportation, road construction, maintenance and decommissioning, site preparation and slash abatement, tree planting, fertilization, silvicultural thinning, wildfire suppression, and stream restoration, as described below. During the plan period, BLC may apply insecticides, fungicides and herbicides (referred to jointly as “pesticides”) in the HCP areas as needed to control vegetation and organisms that may suppress or inhibit tree growth. All pesticides will be applied in accordance with applicable regulations of the Environmental Protection Agency (EPA) and applicable laws of the state of Washington. The application of pesticides is not intended to be a covered activity under the HCP. However, incidental take statements issued as a result of Section 7 consultations between the Services and the EPA may cover those activities. Specific forest management activities to be covered under this plan are as follows:

- Timber harvest, including felling, bucking, and yarding of timber with ground, tower, or aerial logging systems
- Transportation of logs from BLC lands via roads
- Helicopter operations, including log transport, landing construction and the development of fueling points
- Road construction, maintenance, and decommissioning, including clearing of rights of way for new roads, excavation of road cuts and fills, installation of culverts, surfacing of roads, road surface and culvert maintenance, use and maintenance of existing fords¹, brush control along road corridors, seeding, maintenance and installation of erosion control measures, and temporary or permanent road closure
- Site preparation and slash abatement, including preparation of harvested sites for planting by bulldozer blading or other means, and burning of slash in accordance with applicable Washington State law

¹ There will now be only 5 fords across the Robinson Fork. Moreover these fords will only be used for light administrative and hunter use.

- Tree planting
- Fertilization of certain timber stands up to two times between the stand ages of 15 and 40 by aerial application of approximately 440 pounds of nitrogenous pelletized fertilizer per acre in compliance with the Washington Forest Practices Rules WAC 222-38-030 (2001) that prohibit application of fertilizers to wetlands and streams²
- Silvicultural thinning of timber stands, including commercial thinning and pre-commercial thinning of stands younger than 30 years old
- Stream and riparian area enhancement projects designed to improve riparian and stream channel habitat in cooperation with local conservation Districts, Washington Department of Fish and Wildlife (WDFW), Natural Resource Conservation Service (NRCS), and other qualified agencies

3.3.3.2 Grazing

BLC's grazing and livestock management operations are also included as part of this plan. BLC manages 18,273 acres of land for beef cattle production. BLC's current herd typically includes 800 cow/calf pairs, well below the land's carrying capacity. Historically, a portion of BLC's herd was moved seasonally from Pentecost Pasture and other areas to the forestlands of the Robinson Fork. However, because of the impacts of the fire in Robinson Fork and the need to re-establish trees, BLC has enrolled the riparian areas (Figure 3) in CREP and will fence them to exclude all grazing for the term of the CREP contracts, although upland areas of Robinson Fork will be grazed once new trees in the burned area become established. Specific pasture areas and their management are covered in more detail in subsequent sections of this document. However, the range and livestock management activities to be covered in this plan include:

- All normal grazing, pasture rotation, and herd dispersion practices;
- Fence, gate, and cattle guard construction and repair;
- Winter feeding operations and year-round placement of salt or other nutrients;
- Location, construction and repair of temporary or permanent watering devices;
- Construction and repair of temporary or permanent corrals and loading facilities;
- Construction, repair, and operation of temporary veterinary and medical treatment facilities;
- Location of such temporary housing as tents, trailers or small buildings designed for limited use by people who are assisting with livestock herding, calving or shipping;
- Collection and removal of animal wastes, including land application of manure under appropriate state regulations;
- Disposal of dead animals.

² The most current version of the Washington Forest Practices Rules may be found at www.dnr.wa.gov/forestpractices/rules.

3.3.3.3 Farming

BLC owns 15,017 acres of farm land. Of this total, BLC has placed 2,100 acres of farm and grazing lands into Conservation Reserve Program (CRP) status, and we include these lands and the management of them as part of BLC's farming land use. BLC also rents 1,963 acres of farmland to other operators. These lands are also included as activities covered by this HCP and would be subject to all of its requirements, with future rental agreements specifying practices for these lands that are consistent with the terms of the HCP. Lands which are rented to other operators will be monitored for HCP compliance as all other lands covered through this plan. The remaining 10,954 acres is farmed by BLC. Most of BLC's farming operation is dryland (not irrigated), with winter wheat, spring wheat, barley, peas, lentils, and other grains as the principle crops.

The farm practices to be included in this plan are:

- Normal plowing tillage and cultivation;
- Planting, fertilizing, and land application of manure;
- Harvesting of crops and mowing;
- Burning of weeds, grass, and stubble;
- Fence construction and maintenance;
- Road construction and maintenance;
- Occasional or emergency use of existing fords (Patit Creek), generally with rubber-tired farm tractors;
- Construction and maintenance of pumping and water storage facilities;
- Normal irrigation practices as described for lands adjoining Patit Creek and the Tucannon River;
- Ditch construction, cleaning, and maintenance;
- Fallow treatment, which means establishment of a cover crop on land that is not farmed for at least one growing season.

3.4 Measures to Minimize and Mitigate Impacts of Take

3.4.1 General Conservation Actions to Address Threats and Stressors

This part of the HCP identifies potential threats and stressors for each of the covered species, along with the conservation actions BLC would take to minimize them or mitigate for them. The threats and stressors were developed from consideration of existing and future land uses, recreational and economic activities currently permitted or allowed to occur within the habitat, and roads or other structures that could affect the habitats and those species that inhabit those habitats. The threats and stressors are identified below.

A list of potential conservation actions in response to each of the potential threats and stressors was evaluated and is discussed in more detail below. The conservation actions discussed below characterize the types and range of responses that BLC would implement in order to avoid, minimize, or mitigate to the maximum extent practicable the effects of each potential threat and stressor on populations and habitat areas in the plan. This list is not intended to be exhaustive or

exclusive, although the conservation measures address the most immediately definable potential conservation actions. The conservation measures include site-specific management actions implemented by BLC's managers, as discussed in Section 3.4.3 of the HCP and activity specific actions described in Section 3.4.2.

3.4.1.1 Problem: Sediment from Land Uses may be Delivered to Streams

BLC response

Rates of erosion and sediment delivery to streams from dry crop areas in parts of Columbia County can be extreme. For instance, the Pomeroy Conservation District (1997) reported that for the Pataha Creek watershed in 1986, "over 1,060,000 tons of soil was eroded from cropland fields each year by sheet and rill erosion at an average of 17 tons per acre. Over 177,600 tons of sediment, resulting from erosion, reaches streams" (3.4 tons/acre-year). Although extensive installation of conservation measures between 1986 and 1992 has reduced these rates substantially in much of the county, they remain high in some areas.

Heavy grazing and poor practices such as over-stocking beginning in the 1860's also caused serious degradation of rangelands in many areas of Columbia County. Again using Pataha Creek as an example of historic conditions, 69 percent of the rangeland was in poor to fair condition in 1986. The 1986 estimate of erosion was ½ ton per acre on the 31 percent of good/excellent rangelands, and 3 tons per acre on the remaining 69 percent of rangelands classed as fair to poor (Pomeroy Conservation District 1997).³

Historic forest management practices have also increased erosion and sediment delivery above natural rates. However, recent estimates of the average rate for all sources of erosion in the forest are 0.4 tons/acre/year, with delivery of 0.03 tons/acre/year (Pomeroy Conservation District 1997). Although these rates are low in comparison to those reported for range and croplands, significant effects of forestland erosion have been reported (Columbia Conservation District 1997; Reckendorf & Associates 2000).

In contrast to these generalized reports, BLC applies no till and minimum till practices to their entire dry farmed acreage and also crops every acre every year. These practices purposefully deplete soil moisture so that there is minimal winter runoff, and they maintain maximum soil infiltration and residual ground cover. The result is surface erosion on BLC croplands that averages 10 percent or less than that



Broughton's farm lands are heavily bisected by hundreds of heavily vegetated grassed waterways.

³ Quantities of sediment delivered to streams from rangelands were not reported in the documents reviewed for this HCP.

produced by more conventional tillage practices that remain widespread throughout the Palouse region and Columbia County.⁴ Moreover, because virtually all BLC farmed acres are isolated from streams by riparian zones and grassed waterways, the rate of sediment delivery is likely to be disproportionately low compared to the county-wide averages where buffers are not always employed. This combination of advanced state of the art best known tillage practices coupled with riparian management zones provides for minimization of erosion and mitigation of potential delivery of sediment to streams to the maximum extent practicable.

There are virtually hundreds of grassed waterways within BLC's cropland areas. BLC's 1999 land appraisal shows that there are 1,260 acres of waterway within 19,866 acres of cropland area, yielding 6.3 percent of the area in waterway. These waterway areas have been mapped by the Farm Services Administration (FSA) as part of various agricultural programs, and are on file at the FSA office in Dayton. Widths of these grassed waterways meet the requirements of the Farm Bill Conservation Plan and were determined through design consideration of soil characteristics, contributing watershed area, adjacent land use and management practices, precipitation and climatic characteristics, upland slope, channel slope, and other factors.

Widths of these waterways therefore typically vary from approximately 20 to 40 feet. Designed to prevent gully erosion, these waterways have proved to be fully effective and provide for minimization of erosion to the maximum extent practicable.

BLC's 2,100 acres of land currently placed in the CRP program are subject to 10-year contracts. Upon expiration of a contract, BLC may apply for contract renewal. BLC has had nearly 100 percent success in renewing its CRP contracts. Moreover, the company is committed to maintaining these areas in CRP as long as enrollment is available.⁵ A requirement of the CRP contract for an area requires that the prescribed conservation practices be improved. Therefore BLC's commitment to renew the contracts to the extent that such opportunities remain available ensures continual improvement of the conservation practices for these areas. If BLC cannot continue enrollment in CRP, BLC will farm or graze the land with standards similar to those described in this document, thereby ensuring minimization of sediment delivery into streams.

Some of BLC's pastures have been subject to invasion of non-native species (i.e., downy brome, star thistle, mustard, etc.) that often have low wildlife forage value, or that are even toxic as browse species. BLC is currently improving conditions throughout its major pasture areas, including the Pentecost, Pataha, and grazed portions of the Tucannon Block by re-establishing

⁴ McCool et al (1999) provide an excellent summary of 13 years of experimental research that quantify water runoff and soil erosion relationships for tillage practices for non-irrigated cropland of the Northwestern Wheat and Range Region. They report that minimum and no-till practices that produce greater soil residue cover maintained infiltration rates greater than rainfall rates for nearly all events, and that only when soils were frozen did runoff occur. Moreover, "The effects of (tillage) treatment on soil loss were even greater than on runoff, with soil loss from minimum-till being only 7% that from conventional seeding and from no-till only 10% that from conventional seeding" (Dowding et al 1984).

⁵ Renewal of a CRP contract requires that conservation measures be further improved for the renewal period as compared with the previous contract period. One small (19 acre) area of Broughton CRP land placed in heavy grass and successfully reforested with Ponderosa pine was not renewed because no further improved conservation practices could be identified for the area. Notwithstanding loss of the CRP status, Broughton commits to maintaining these existing conservation practices for the area for the life of this HCP.

new pasture grasses. For the past 2 years, BLC has been planting spring grain on these areas to compete with the weeds and other undesirable vegetation in order to ultimately deplete the weed seed bank in the soil. BLC is then planting the areas with a native and preferred perennial grass, such as Sherman Big bluegrass, tall fescue, and Big Blue bunchgrass. BLC is also using rotational grazing to improve grass stands. The rangeland pastures are fenced into cells and then grazed on a seasonal rotation. Watering systems are also being improved to disperse the cattle over a larger area away from main watering areas and streams. These pasture and vegetation management practices provide for continually improved rangeland conditions that provide for minimization of erosion and protection of habitat within downstream fish-bearing channels to the maximum extent practicable.

Accelerated rates of surface erosion caused by logging within Robinson Fork, BLC's major forestland holding, were not observed by the WDNR during the course of their watershed assessment, except where skidding had occurred down draws and from forest roads, which were assessed separately (WDNR 1998). These sources of erosion are eliminated and minimized, respectively, by the mandatory prescriptions developed in that analysis. BLC operates within those requirements.

Sediment delivery within the Robinson Fork was estimated to have increased 320 to 1,500 percent above natural, due primarily to unsurfaced logging roads in the valley bottom (WDNR 1998). The "Bottom Road" and intersecting roads on BLC ownership constitute nearly all of these valley bottom stream and adjacent road mileage. BLC's lands within the Robinson Fork include 23.4 miles of road, with 7.0 miles of these roads parallel and adjacent to the stream. All of these roads were addressed by BLC in 2002 within a comprehensive Road Maintenance and Abandonment Plan (RMAP) as required by the Washington Forest Practices Act (2002). This plan was approved without modification by the WDNR following the required review by the WDFW and is included with this HCP as Appendix 2, and is included as conservation measures for this HCP.

BLC addressed all current maintenance problems associated with roads located near the Robinson Fork, abandoned parts of these roads, and currently uses remaining road sections only for light administrative and herding uses.⁶ A total of 1.89 miles of these roads will be drained, seeded, and abandoned as a formal RMAP procedure, and nearly all of the remaining stream adjacent road (the "Bottom Road") has already been converted from actively used logging road to a lightly used administrative-use-only road. All cut and fill slopes subject to erosion and delivery of sediment to streams must be seeded to erosion resistant vegetation. In addition, specific sections of the road with particularly troublesome erosion sources are being redesigned to drain away from streams, surfaced with rock, and drained to constructed sediment traps that are isolated from the streams. Elimination of log haul traffic alone reduces the relative quantity of road surface erosion from these abandoned and administrative use only roads to approximately 1.25 percent of the original amount of erosion (WDNR 1998). These measures plus additional structural and vegetative measures implemented as part of the RMAP provide for

⁶ This road will no longer be used for access by logging machinery, log landings, or for log hauling. The road will be used for occasional pickup truck, 4-wheeler, and horses for access to the lower canyon areas near the river. One of these uses includes the routine search for cattle that may stray into the riparian area adjacent to the Robinson Fork, and the herding and removal of these animals to upland areas.

an aggressive and highly effective road erosion and sediment delivery control effort that minimizes road erosion and delivery of sediments to the maximum extent practicable, and are herein estimated to be consistent with reduction factors from the watershed analysis manual to reduce sediment delivery from the stream adjacent roads on BLC's lands to approximately 1 percent of the original amount of sediment delivery.⁷

Estimated sediment increase above natural following implementation of BLC's RMAP measures is unknown, and will be unknown until the entire road system is re-analyzed within the watershed on all ownerships. This is beyond the scope of this HCP. However, we estimate that approximately 90 percent or more of all road sediment delivered from roads located within BLC's ownership originated from the valley bottom road segments addressed by BLC's 2002 RMAP, and that well over 90 percent of sediment delivery within the Robinson Fork from BLC's road system has been eliminated from implementation of the RMAP.

As noted previously, the Columbia Complex fire of 2006 killed a significant volume of timber that must now be salvaged. Salvage operations will be conducted according to the applicable Washington Forest Practices Act rules, but it is reasonable to expect a spike in sediment from the increase in skid trails, truck traffic and loss of both the trees and the buffering grass and shrubs killed by the fire. This is a short-term effect that was minimized on steeper slopes by contour falling whips and poles every 50 to 60 vertical feet and seeding with grass to minimize erosion. Where available, live trees were left as seed sources for regeneration. Other areas will be replanted with seedling stock. BLC has enrolled major parts of Robinson Fork in the CREP and eliminated grazing in the riparian areas. It will be many years before the burned areas are once again ready and available for timber harvest, and the reduced future logging intervals, fencing and elimination of grazing in the riparian areas with resulting regrowth of trees and shrubs will result in decreased sediment delivery to Robinson Fork in the long term.

Roads in cropland and farmland also pose potential problems. Two existing roads were identified as erosion hazards, and both were surfaced and maintained to reduce this erosion by at least 90 percent as a commitment of this HCP. BLC also proposes that new roads that may be built on lands covered by this HCP, irrespective of the use of those lands, be built and maintained in concurrence with the goals and objectives for roads relating to minimization of sediment delivery to streams and riparian impacts found within the July, 2001 Forest Practices Act Rules. In the event that these July 2001 regulations are modified, BLC would provide and implement equivalent or greater habitat protection. Implementation of these farm, rangeland, and forest road erosion and sediment delivery conservation measures provide for mitigation to the maximum extent practicable.

⁷ These sediment control measures and the RMAP were designed by Dale McGreer, one of the authors of this HCP. Mr. McGreer is a Washington certified Level II expert in Watershed Analysis Mass Wasting and Surface Erosion, and is a Washington State licensed Engineering Geologist, and Washington State licensed Hydrogeologist.

3.4.1.2 Problem: Land Management Practices May Reduce Shade and Increase Water Temperature

BLC response

Elevated water temperature is a concern in virtually all of the streams that pass through BLC lands. However, over the past 10 years or more, BLC has implemented a number of riparian management practices that mitigate these conditions and plans a number of additional conservation measures as part of this HCP.

Farming operations that potentially affect stream shade and water temperature of fish-bearing waters are very limited. No areas of Pataha Creek or the Robinson Fork lie adjacent to BLC agricultural lands. The Tucannon River passes through several miles of BLC lands, but is nearly always well shaded by mature and diverse hardwood and brush riparian forest. The only exception occurs for approximately 300 feet of the downstream end of Tucannon Block #1, where the 1996 flood destroyed adjacent vegetation; this area has been revetted and planted to tree and brush species.⁸ Some reaches of Patit Creek within BLC lands have experienced solar exposure and increased water temperatures as a result of land management. These conditions are being addressed by management measures proposed within this HCP that would provide for maximum potential shade of the Patit Creek water column and would mitigate potential temperature effects to the maximum extent practicable.

Grazing operations that potentially affect stream shade and water temperature of fish-bearing waters are very limited. Pataha Creek was historically affected within BLC lands, but fencing and elimination of grazing near the stream are expected to stabilize stream banks and allow rapid revegetation with trees and brush. BLC no longer grazes lands adjacent to the Tucannon River, and ensured riparian protection by enrolling a portion of the Tucannon River ownership in the CREP program in 2002. Riparian areas along the Tucannon River are now fenced, although cattle can cross the river from upland pastures to valley floor winter feeding pastures at one location that is gated. Any actual crossings are limited to emergency situations and cattle would be herded across the river at that single location.

Various assessments of the Robinson Fork have reported that cattle have adversely affected the riparian zone, and it is possible that stream shade has been reduced. Prior to the Columbia Complex fire, BLC had proposed to minimize and mitigate potential impacts by reducing the number of cattle within the Robinson Fork pasture from the historic high of 300 cow/calf pairs to 200, strictly regulating use seasonally, herding cattle from the riparian area if and when found there, and culling “repeat offender” cattle from the herd when repeatedly found in the riparian area. Had these measures not been effective in keeping cattle from the riparian area, BLC would have constructed 2 to 4 fences to prevent cattle from using the road along the creek as a way to

⁸ Parts of this section of the river are naturally unstable because coarse sediment was deposited in the area during the 1996/1997 flood, and may have occurred earlier during previous flood events. These sediments originate through channel transport of materials from watershed stream channel and mass wasting sources located on lands not owned by Broughton. Whether this local area of channel instability eventually stabilizes and becomes fully revegetated with a riparian forest community will be controlled by watershed and stream channel processes beyond Broughton’s feasible control.

enter riparian areas. As noted previously, BLC now plans to eliminate all grazing within Robinson Fork riparian areas for the term of the CREP contracts.

Historical riparian area harvest and, to a lesser degree, road management practices, have reduced riparian shade along several miles of the Robinson Fork. Washington State's 2001 Forest Practices Rules strictly regulate shade retention and harvest along the Robinson Fork and its perennial tributaries. Under these new rules, riparian harvest must be described in a forest harvest permit application, and is subject to approval under the rules that govern these practices and are designed to ensure that harvest does not deplete shade or large woody debris recruitment to levels considered by the State to be harmful. These practices are designed to protect bull trout and anadromous fish from all potential effects of harvest on shade and water temperature, and to provide for a long-term supply of large woody debris (LWD) reflective of conditions found within mature forests, and therefore provide for mitigation of these potential effects to the maximum extent practicable.

3.4.1.3 Problem: Potential for Excessive Bacteria and Nutrients and Resultant Undesirable Aquatic Plant Growth

BLC response

Excessive levels of bacteria, and to a lesser degree, nutrients, have been noted as water quality concerns within Pataha Creek and the Tucannon River. These problems have been largely attributed to point source discharges, cattle feeding, and unrestricted channel-adjacent grazing uses (Pomeroy Conservation District 1997; Columbia Conservation District 1997). BLC is eliminating such uses on its lands bordering these streams and implementing CREP or similar riparian buffers in many locations for the life of this HCP.

BLC fertilizes its croplands each year with 50 to 150 pounds of anhydrous ammonia NH_3 nitrogen, 10 to 20 pounds of phosphorus, and 10 to 20 pounds of sulfur, per acre. The phosphorus is rendered immobile by binding to the soil particles and does not leach through the soil column; it only reaches streams through surface erosion that carries phosphorus with it. Sulfur is leachable through the soil column, but is not of concern as a nutrient to streams. Nitrogen is partially bound within the soil but quantities associated with fertilization can be leached through the soil once soils have warmed in the spring if not utilized by the crop. Because nitrogen fertilizer is quite expensive, BLC tests the soils of each field each year prior to applying nitrogen. The objective is to apply the nitrogen so that it remains within the rooting zone of the crop and is utilized by the crop during the growing season prior to harvest, with only low residual amounts remaining and bound within the soil, which are unlikely to be lost through leaching. Coupled with BLC's practice of cropping every field every year which results in purposeful depletion of soil moisture, minimal movement of water and nitrogen occurs. Table 3 provides a representative example of pre and post-soil nitrogen content by depth within the soil.

Table 3. Soil Nitrogen Relationships

Soil depth (Feet)	Nitrogen (lbs per acre) following plant uptake	Nitrogen (lbs per acre) following fertilization
1	3	28
2	3	47
3	4	66
4	8	23
5	6	9
6	4	9

Fertilizer is applied aerially by plane, as well as broadcast or cultivated into the soil by tractors. Aerial applicators are required to follow strict rules designed to prevent direct application to live sources of water or wetlands, a practice that is also in BLC's interest, given the cost of fertilizers. In addition, BLC may apply manure to some lands, but this is not a common practice since the company's cattle are seldom confined in a way that concentrates manure. To the extent manure is applied, BLC would not apply it to frozen ground and limit applications to level land where there is little opportunity for runoff. These advanced management practices mitigate potential effects on water quality to the maximum extent practicable.

The BLC also maintains stream buffers which will assist in capturing nutrients and other chemicals. These buffers are described in section 3.4.2.2.1 (fencing and water development) and in 3.4.3 Site Specific and Activity Specific Conservation Practices (see especially Pataha Creek, Tucannon River, Patit Creek, and Robinson Fork).

3.4.1.4 Problem: Grazing, Farming, and Forest Management could Increase the Instability of Stream Banks

BLC response

As mentioned previously, BLC has eliminated grazing and farming adjacent to Pataha Creek, and the Tucannon is already bordered by well-developed riparian forest as it passes through BLC lands, with the exception of the approximately 300-foot section of the reach in Block #1, which has been revetted and replanted. Pataha Creek is expected to revegetate and stabilize through time (USDI 1998; Beschta 1997; Keller et al. 1978). Areas of Patit Creek remain unstable adjacent to some BLC farming and ranching activities; specific habitat conservation measures designed to eliminate these problems along Patit Creek are proposed as part of this plan (see Section 3.4.3.8: Site Specific and Activity Specific Conservation Practices, Patit Creek).

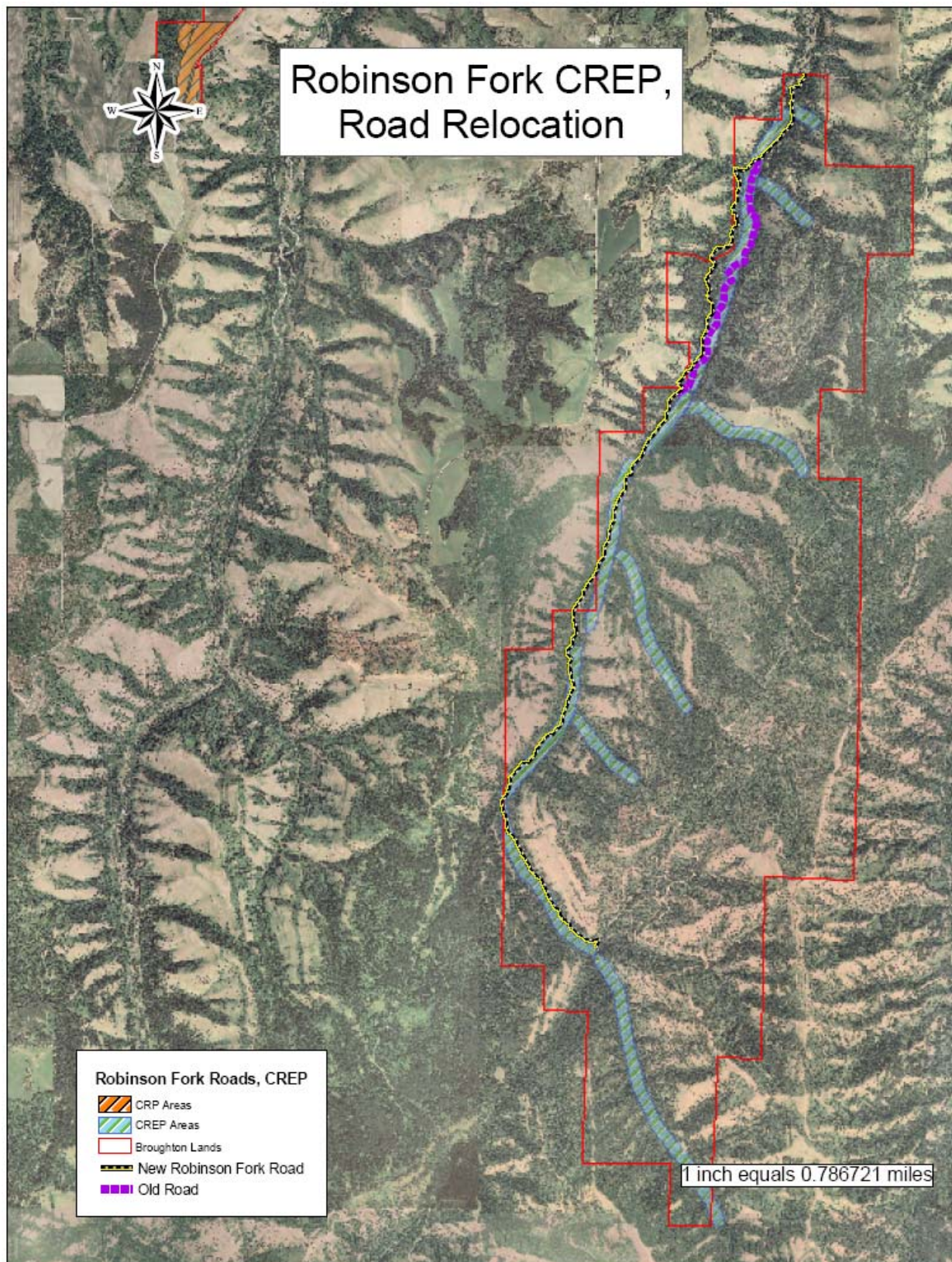
As noted in various agency reports, stream channel and bank stability is poor along a substantial length of the Robinson Fork within BLC lands. BLC proposes as part of this HCP to implement road abandonment and management practices to minimize erosion and sediment delivery and bank instability associated with channel encroachment and to limit harvest within riparian areas in compliance with the Washington Forest Practices Rules (2001). Harvest within riparian areas is strictly regulated by these rules. These rules are discussed more fully in the discussion of Robinson Fork forest practices found in section 3.4.3.12.

In essence, the rules are designed to provide full shade and water temperature control and to provide riparian forests that provide large wood to streams in amounts similar to those provided by unmanaged forests. Management requirements under the rules are even more restrictive when a stream lies within the “bull trout overlay,” which includes the Robinson Fork. In actuality, when Washington’s rules are applied to the conditions as they exist adjacent to the Robinson Fork, few if any trees can be removed from within a distance of 70-feet as measured from the outer edge of the stream channels bankfull width or its channel migration zone, whichever is wider. Application of these rules is complex and governed by a number of sections of the Rules, including WAC 222-30-022 and 222-30-023; and extensive portions of the Forest Practices Board Manual sections M-5, M-11, M-81, including those portions that address determination of adequate levels of shade, measuring physical parameters of streams and channel migration zones, and methods for measuring riparian zone widths and stand characteristics.

These rules and their application would be difficult to succinctly summarized within this HCP document. In practice, whenever BLC might apply for a permit to conduct a forest practice, they must apply each of the applicable rules to determine which if any trees are potentially available for harvest, and must receive a permit for any such tree removal from the WDNR. Moreover, in the event that these July 2001 regulations are modified, all forest management activities would be conducted according to the relevant FPA rules, but in no case shall these practices be carried out in a manner that is less stringent than the FPA rules in place at the time this HCP is approved.

The BLC also commits to install CREP buffers along the Robinson Fork, and maintain those for the life of the CREP contracts. At the end of the CREP contract term (15 years), BLC will evaluate the condition of the riparian vegetation and decide a future course of action as a “changed circumstance”. However, in all likelihood trees and shrubs within the fenced areas will likely be a natural barrier to livestock use of the riparian areas. In addition the fence will remain in place and it is possible that BLC will re-enroll these lands in CREP. At any rate, the buffers established through this management practice will also support stream bank stability. Figure 3 indicates the location of the fences and the areas to be enrolled in CREP in Robinson Fork.

Figure 3. Areas enrolled in CREP in Robinson Fork and the Completed Road Relocation



3.4.1.5 Problem: There is the potential for mass failures of upland slopes

BLC response

Debris avalanche and shallow reactivation of two deep-seated landslides located on BLC lands were noted as problems affecting coarse sediment and channel stability relationships within the Robinson Fork. The South Fork Touchet River (SFTR) Watershed Analysis specifically describes these landslide hazards, their locations, and four “prescriptions” for management of these areas. These prescriptions are site-specific rules that must be applied to these areas. Mass wasting prescriptions are expected to effectively minimize and mitigate future effects of BLC’s forest practices and are proposed to be incorporated into this HCP as habitat conservation measures. They are attached as Appendix 3 to this HCP. Prescriptions apply to different Mass Wasting Units, and include measures such as the following: no skidding or operation of ground-based equipment up or down the stream channel; construct skid trails at least 10 horizontal feet away from the edge of stream channels or draws; skid trails within 40-feet of draws must be sloped to minimize sediment delivery, constructed and used after June 1 and abandoned by October 1; provide buffers or leave-tree prescriptions along streams and draws; construct no roads on slopes over 50 percent without additional geotechnical review; provide cross drains every 500 feet on side slopes above 55 percent; and limit sidecasting of materials depending on slopes and distance from stream. These management practices minimize and mitigate mass wasting hazards to the maximum extent practicable, given the relatively unpredictable impacts of the 2006 fire and the natural vegetation recovery process.

3.4.1.6 Problem: Improperly screened pump intakes and water withdrawals potentially could harm fish

BLC response

BLC irrigates 500 acres of bottomland along the Tucannon River, primarily for alfalfa and grass seed production. Thirteen pumps that feed from the Tucannon River irrigate this land. Twelve of the pumps feed irrigation lines that are manually moved daily during the irrigation season. One pump feeds a center pivot irrigation system. These pumps had ¼ inch fish screens that were replaced with the new-standard 3/32nd inch screens in 2003.

Low seasonal flow is reported to be a known or potential factor limiting the populations of salmonid species in a number of the streams addressed by this plan. These waters include the Touchet River, Walla Walla River, lower reaches of the Touchet River, Patit Creek, and Pataha Creek (Pomeroy Conservation District 1997; Confederated Tribes of the Umatilla Indian Reservation 1990; Mendel et al. 1999). Low seasonal flows for the Tucannon were also reported to be a problem by the 1995 Tucannon River Watershed Initial Assessment (Ecology, 1995). The Assessment concluded that the total quantity of water rights claims and state-issued water rights exceeded the yearly mean daily flow in the lower river. The Assessment also concluded that Tucannon River flows do not meet the instream flows recommended by the Washington Department of Fish and Wildlife for much of the year. Review of a recent 2004 report authored by the Washington State Department of Ecology (Ecology) that specifically discusses instream flow requirements for fish also indicates that low flows are a concern in the Tucannon River.

Tucannon River flows and instream flow information are provided by the recent (2004) Ecology Middle Snake River Watershed Level 1 Assessment Section 6 Tucannon River Implementation Plan. This plan reports that the Tucannon River in the reach above Willow Creek--the area of BLC ownership--has a mean annual flow of 125 cfs, and a normal low flow of 53.3 to 72.4 cfs between August and October (Ecology 2004). These flows include the effects of the long-standing irrigation withdrawals that occurred during the period of record examined (Ecology, 2004).

Ecology (2004) reports that a total of 67 water rights for 60 cfs have been issued in the lower Tucannon River, while additional claims for 133 cfs have not been adjudicated, and that flows fall below the instream target more than 50 percent of the time between July and October, which is likely limiting salmonid productivity. Instream flow requirements are discussed at section 6.2.2 of the Ecology (2004) report. Ecology (2004) also provides low flow recommendations for the Tucannon River at Starbuck. Starbuck is located 3 miles downstream from BLC's nearest irrigated ownership on the Tucannon. Referencing a letter from the WDFW based on an IFIM study (Ecology, 2004 Table 6.2.5), Ecology recommends an instream flow of 75 cfs for the period June 15 to August 14, and 85 cfs for the period August 15 to November 30 at Starbuck. Low flows at Starbuck commonly fell below these recommendations. Minimum flows in the Tucannon, as recorded by the USGS at Starbuck, occur in August and September. Looking at the USGS record that dates continuously from 1959 through 2002, mean monthly low flow for August is 61.4 cfs, increasing to 70.7 cfs in September. These flows include the effects of irrigation withdrawals above, within, and downstream of BLC lands that occurred during these years. However, both Willow Creek and Pataha Creek join the Tucannon between Starbuck and the nearest irrigated BLC lands, and a low flow recommendation for the Tucannon in the area of BLC ownership is not provided by Ecology (2004).

Nevertheless, in 2003 BLC responded to the low flow concern in the Tucannon by voluntarily placing the majority of its Tucannon River irrigation water rights into the Washington State Irrigation Efficiencies water trust program. BLC's enrollment in the program is confirmed by surface water certificate 11362 issued for 11.15 cfs. This certificate documents that BLC has placed 6.4 cfs into the Trust, and that because of the new and more efficient pumps and irrigation delivery systems that were installed, BLC retains only 4.75 cfs for continued irrigation. While there is uncertainty regarding the exact amount of instream flow that would be appropriate for the Tucannon River above Willow Creek in the area of BLC's lands, BLC's improved irrigation facilities and practices, coupled with its voluntary placement of the majority of its water rights into the water trust and installation of WDFW-approved intake screens, minimize impacts from irrigation to the maximum extent practicable consistent with BLC's land management requirements.

3.4.1.7 Problem: Vehicle Use of Fords through Robinson Fork could Impact Fish Spawning Redds.

BLC Response

The original number of stream crossings, both bridges and fords, through and across the Robinson Fork on BLC lands totaled 13 prior to the 1996/1997 flood. BLC has relocated and

abandoned many of the roads that required these crossings. BLC's Road Management and Abandonment Plan (RMAP) approved by the WDNR and implemented by BLC now limits these crossings to one bridge and 5 fords located at long-standing crossing points. There are no new ford or bridge locations. Like much of the Robinson Fork stream channel, the fords occur in areas of coarse basalt cobble that has been compacted by construction equipment and subsequent road use by log trucks and heavy equipment, and that provide relatively poor potential spawning habitat. These crossings will now only be used for light administrative and hunting access purposes. Because the basalt cobble at these crossings contain relatively few fines, and because the approaches to each of these fords are stabilized and surfaced by crushed or naturally occurring basalt as a condition of the RMAP, light administrative traffic would introduce or remobilize only insignificant amounts of fine sediment.

Direct damage to redds that could potentially occur within stream fords is also a potential fish impact. BLC believes this to be highly unlikely given the limited use of steelhead (the one species covered by this HCP known to currently occur in the area of the fords) within the Robinson Fork and because these basalt cobble formations are the predominant substrate in much of the river. Nevertheless, to address this concern, BLC agrees to work cooperatively with WDFW in conducting spawning surveys in Robinson Fork including field visits with WDFW to make sure that BLC staff can identify redds. Currently, WDFW personnel contact BLC to let them know of their plans for these surveys and BLC's manager offers any on-site assistance that would be useful to this effort. If WDFW is not conducting surveys, then BLC will notify WDFW and FWS and NMFS if the company's personnel observe any redd(s) in Robinson Fork.

3.4.2 Activity Specific Conservation Measures

3.4.2.1 Forest management

The Washington Forest Practices Rules (WFPB 2001), and the South Fork Touchet River watershed analysis mass wasting prescriptions are included as the basis for this HCP's conservation measures. In the event that the July, 2001 Forest Practices Rules or mass wasting prescriptions are modified, BLC would provide and implement equivalent or greater habitat protection. BLC's basic road abandonment and relocation plan⁹, timber harvest management and expectations for the riparian management in the Robinson Fork, and additional conservation measures that address grazing in the watershed are suggested and discussed in section 3.4.3 of this EA/HCP.

In the summer of 2006, the Columbia Complex wildfire swept through about 10,000 acres of BLC's holdings, including the Robinson Fork, other forest areas, as well as some of the range and crop plantings. In Robinson Fork and other areas where stands of young trees had been established, large quantities of mature timber and virtually all reproduction was killed. As with most forest fires, the damage from the fire was patchy. The riparian areas of the major streams

⁹ The Forest Practices Rules (2001) require that a landowner prepare plans that cover 20% or more of its ownership each year for five years beginning in 2001, and to complete the actual work called for by the RMAP over a 15-year period beginning 2001. Broughton has exceeded these requirements within or sooner than the Rule requirement, a commitment made per this HCP. Broughton's approved 2001 RMAP that addresses the road system near the Robinson Fork is attached as Appendix 2.

did not burn, while the ephemeral side streams in Payne Hollow and in the Patit watershed burned intensively. Cougar Canyon burned but the riparian area did not burn hot. The planted tree farms in these areas were a total loss. Assessment of the damages and probable effects is not complete at the time that this document is being readied for public review. Appendix 6 summarizes timber condition and wildfire damage in the Robinson Fork parcels. It is not yet known the extent to which the hydrology and water quality will be affected as a result of the fire. Figures 4 and 5 provide some indication of both the nature of the fire and areas which deliver significant amounts of sediment to Robinson Fork in major storm events.



Figure 4. Some areas of Robinson Fork burned intensely, killing all trees. Salvage logging has or will have removed most of the timber that retains any commercial value.



Figure 5. Side draws where the fire burned intensely can be expected to act as delivery points of sediment and fire debris during heavy rains, either from thunderstorms or during wetter months.

Prior to the fire, BLC managed Robinson Fork through relatively frequent entries using the existing road system to selectively harvest mature timber along with trees that were at risk to insects or disease. From a forestry standpoint, the management of the forested area of Robinson Fork reflects a rather conservative strategy, characterized by frequent logging entries into the northern and central portion of the drainage but with relatively small volumes taken in each entry. The exception is the southern portion of the property, which represents about one-quarter of the commercial forestland within the drainage. There, timber has not been harvested for at

least the last 40 years (Creative Resource Solutions “Newby Mountain Timber Valuation”, 1999).

Timber cruise data presented by Creative Resource Solutions show that of the 5,162 acres of land within Robinson Fork, 3,629 can be considered capable of producing commercial crops of timber on a sustained basis. Of this acreage, 3,354 had some timber of harvestable size on it, attesting to BLC’s strategy of removing small amounts of timber from the northern and central portions of the drainage at frequent intervals. By contrast, one would expect that with a strategy of less frequent harvests but with much higher per acre volumes--such as clearcutting and replanting--at least one-half the acreage would contain only seedlings or saplings, rather than harvestable sized timber.

This same evaluation divides the Robinson Fork lands into 6 distinct timber types, characterized by the mix of species and density of the stand. The following table summarizes these types.

Table 4. Summary of BLC Timber Types and Volumes

Type	Approx. Species Mix	Approx. Volume Per Acre	Acres		
			North	Central	South
Type 1	P. pine (80%), DF (10%), GF	7 MBF/Ac	111	0	0
Type 2	Doug. Fir (70%), P. pine (21%)	10-20 MBF/Ac	175	89	0
Type 3	Doug. Fir (50%), GF (45%), PP, L	13 MBF/Ac	0	0	488
Type 4	GF (50%), Doug F. (25%), PP, L	8-10 MBF/Ac	14	120	0
Type 5	Doug F (40%), GF (30%), PP, L	7 MBF/Ac	0	93	0
Type 6	GF (40%), Doug F (35%), PP, L	2-3 MBF/Ac	183	1,744	337

*PP- ponderosa pine, DF- Douglas-fir, GF- grand fir, and L- western larch

Normally, one would have assumed a continuation of this conservative but highly effective approach to a sustained yield of timber from Robinson Fork. However, the Columbia Complex fire in 2006 changed the conditions and revised the harvest expectations. Now, there is no choice but to complete the salvage of the timber killed by the fire and assure the regeneration of new trees, either through relying upon remaining live trees as a seed source or by planting new seedlings.

The BLC intends to promptly salvage harvest the timber that was killed or is dying as a result of the fire, starting with the most seriously burned areas, particularly those containing concentrations of ponderosa pine. Most of the salvageable timber resides in areas that can be

tractor harvested with only minor areas that will need helicopter or skyline harvest. On steeper slopes, BLC will contour fall whips and poles every 50 to 60 vertical feet and seed with grass to minimize erosion. Where available, live trees will be left as seed sources for regeneration. Other areas will be replanted with seedling stock.

The BLC has also now enrolled the mainstem Robinson Fork in CREP, fencing the entirety to exclude livestock. This will protect the regrowth of riparian vegetation from herbivory, and trampling, facilitating more rapid regrowth and shading of the water. It will also protect the banks from trampling and minimize sedimentation into the stream, helping return the stream bed to suitability for steelhead spawning. These additional riparian protections will provide an increased buffer to better collect sediment after the fire.

It should be noted that fires of this nature are normal in these ecosystems, although the intervals between them might exceed 100 years. Inevitably, stand replacing fires create opportunities for sediment delivery to streams, usually through “pulse” events, such as summer thunderstorms or heavy winter rains. Indeed, the general terrain of Robinson Fork--steep hills with numerous side draws--is a result of fires and storm events. Forbs and grasses have recolonized the site and in the winter immediately following the fire, little additional sediment was noted in the stream. However, large storms or rain on snow events may well happen and could cause short-term, “pulse” impacts which are unpreventable.

The fire did not appreciably modify the land’s inherent productivity, however. Trees will again grow there and reach maturity. It is reasonable to expect a growth rate (measured in terms of sawtimber production) of perhaps 175 board feet/acre/year. This means that once new sawtimber-sized trees reoccupy the site, then total sawtimber growth in Robinson Fork will approach 2.6 million board feet per year (based on 3,629 acres of commercial forest land). This is the amount that can theoretically be harvested each year on a sustainable basis, although, in a practical sense, harvests might take place every 5 or 10 years, with the harvested volume roughly equal to the annual volume multiplied by the years since the last harvest.

Such a scenario will not now be achieved for many years. Unburned pockets of timber will continue to grow and represent timber that can be harvested, although volumes harvested will likely be far less than if the entire watershed contained timber with a distribution of age classes that would allow for a sustainable harvest equal to the annual growth. Until that distribution is reached (which may take 50 years or more), timber harvests within Robinson Fork after the salvage of fire-killed timber is complete will be infrequent and small. It is impossible to predict harvest volumes and possible dates at this time. As before, all harvests will be conducted in compliance with the Washington Forest Practice Act rules in existence at the time.

The South Fork Touchet Watershed Analysis was conducted in 1998, and the Washington Forest Practices Rules and the Forest and Fish Agreement require that the watershed be reassessed by the WDNR at approximately 5-year intervals. However, reassessments reportedly have a low priority for completion and this one has not been completed as of the date of this agreement. Prescriptions for the management of the area will remain in effect until a reassessment (WDNR 1998).



Figure 6. Prior to 2006, Broughton's forest management was characterized by relatively frequent but small selective harvests. This will continue in the future after timber in the burned areas reach maturity, with very little need for additional roads and with harvesting regimes that will maintain historical canopy cover.

3.4.2.2 Grazing

Raising beef cattle is a key component of BLC's business. The company intends to continue this part of its operation by managing its suitable grazing lands to support approximately 800 cow/calf pairs. This would mean continuation of grazing in the Pentecost and Pataha pastures, on lands bordering Patit Creek, and in the Cougar Canyon Block. However, following the fire of 2006, BLC plans to forego grazing in previously forested areas until new trees are well-established. As discussed earlier, in the Robinson Fork, BLC will fence riparian areas and enroll these areas in CREP to exclude all grazing in them for the life of the CREP contracts. BLC will revisit grazing management in the Robinson Fork after the CREP contract ends.

BLC recognizes livestock grazing, if not well managed, can impact riparian habitats and water quality. Stream bank trampling and reduction in riparian vegetation due to unmanaged grazing can lead to channel widening, downcutting, and decreased stream bank stability. There is also the potential for greater sediment delivery to streams, along with increased bacterial and nutrient loads from animal wastes. Finally, there is the potential for grazing to retard the regrowth of broad-leaved vegetation in the Robinson Fork riparian area, where much of the streamside cover was destroyed during the 1996-1997 floods.

In order to minimize the impacts to water quality, riparian conditions, and instream fish habitat, BLC proposes the following grazing and range management practices. Some of these represent a continuation of BLC's traditional practices. Others are new and represent both current thinking among the grazing community and innovations which BLC's managers believe will lead to long term benefits to aquatic species and habitats.



Broughton has constructed several off stream watering tanks and plans to build others as conservation practices under this HCP.

Over the term of this HCP, there may be occasions when land uses within the BLC ownership change and additional areas are used for grazing. This change in traditional land use could occur as the result of fires in the forested lands that allow the growth of additional forage or changes in commodity prices that either make grazing more attractive or certain types of farming less so. The potential for these shifts in land use is a foreseeable event and, therefore, further addressed in the discussion of "changed circumstances." However, if lands are opened to grazing which are not currently used for that purpose then BLC would manage those lands in a manner consistent with the general grazing practices outlined in this section.

3.4.2.2.1 *Fencing and water developments*

BLC proposes to fence 1,500 feet along Patit Creek #4, install a watering system away from the stream, and relocate the fence along Patit #1 to provide a wider riparian area. In addition, BLC has fenced the entire length of its lands bordering Pataha Creek (approximately 2,600 feet) to eliminate impacts of cattle and has drilled a well and installed three watering stations away from the Pataha riparian area.

Along the Tucannon River Block #4 as part of its CREP contract commitments for the area, BLC built two new watering devices in the uplands and away from fish-bearing streams. Construction of these developments has been completed according to Table 5. In addition, cattle access to the river will be eliminated following construction of fences adjacent to the river 75-feet from the edge of the ordinary high water mark (Figure 7).

Table 5. Fencing and Water Development Projects

<u>Location</u>	<u>Type of Device</u>	<u>Installation Date</u>
Pataha	Fence/well/watering system	2001
Patit	Fence/ watering systems	2003
Tucannon	Pumps/tanks/watering system	2002

Figure 5 illustrates the total number of various water developments on BLC's lands designed to draw cattle away from streams.

3.4.2.2.2 *Herd management*

In the past, BLC grazed cattle in Robinson Fork and used both herd management practices and culling of habitual riparian grazers to assist in focusing the cattle on the higher elevation grass forage. However, since the fire, BLC will implement CREP buffers in Robinson Fork to eliminate all grazing in the riparian areas.

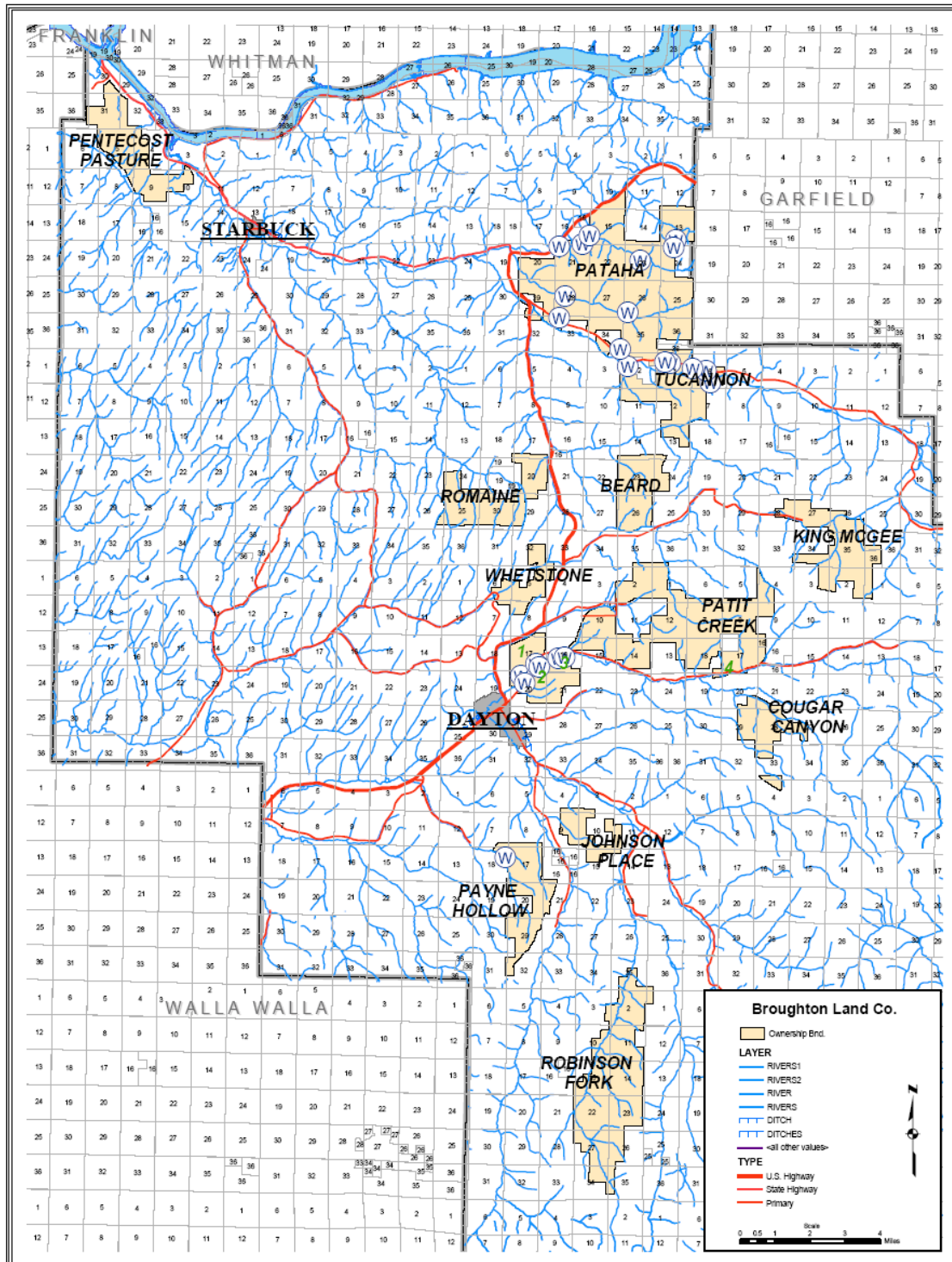
In other grazed pastures, salt will be located at least 500-feet away from streams, seeps, and springs, if at all possible. Salt placement will be designed to draw cattle away from all flowing water sources and riparian areas and to encourage the use of alternative sources of water. How and where salt is placed will be decided on a case-by-case basis with these objectives in mind.

There is a new program authorized by the 2002 renewal of the federal "Farm Bill" in which BLC would like to participate. This "Conservation Security Program" (CSP) provides payments to landowners on a per acre basis, with the amount of the annual payment tied to the level of conservation practices the landowner is willing to undertake. Currently, this program is not available for the watersheds that include the BLC's land, but it is expected to include these watersheds within the next several years. Once BLC's lands become eligible for the CSP, BLC is of the opinion that the existence of an approved HCP will be the determining factor in approving the company's lands for the highest level of participation in the program. If the company is approved at this level, additional conservation measures for grazing may be implemented, as required by the CSP.

3.4.2.2.3 *Rest and rotation of pasture lands*

BLC has four major blocks of dry grazing lands--the Pentecost pasture, the Pataha Block, Tucannon Block #4 (south side of the Tucannon) and the forested lands in Robinson Fork (see Figure 13 in Chapter 6). These lands are managed by a grazing/rest/rotation system that provides approximately 6 months of rest (no grazing) within each 12-month period. This is accomplished by alternating the seasons of use. For example, lands that are grazed in the spring and summer of the first 12-month period are rested and then grazed in the fall and winter of the second year. Therefore, BLC's pastures are managed to allow a minimum of 6 months of rest for every 6 months they are grazed. The "rest" period would include a growing season.

Figure 7. BLC's Off-Stream Water Developments



3.4.2.3 Farming

BLC's farming operations adjacent to fish-bearing streams are limited to nearly flat lands in the floodplains of the Tucannon River and Patit Creek. With the exception of some areas of Patit Creek, farm fields are currently separated from streams by riparian vegetation, and in most cases the buffers are fenced. BLC proposes to maintain existing riparian areas and buffers adjacent to the Tucannon River and Patit Creek, and to establish a wider, more effective buffer along the reaches in Block #1 and #4 of Patit Creek, as detailed in section 3.4.3. These buffers, coupled with certain upland management practices such as annual cropping and erosion control management practices, are intended to minimize and mitigate for potential effects upon stream processes that affect water quality and instream habitat-forming geomorphic processes, including stream shade/water temperature, erosion and sediment delivery, bank and channel stability, and large woody debris recruitment potential.

BLC now uses a continuous crop system in which a crop is grown on every acre every year. This dries the soil profile so that the infiltration rate of the soil is always higher than the rate of rainfall. BLC has also implemented a minimum tillage and direct seed system that has increased



Typical farmland within BLC's ownership

the amount of organic material on the soil surface. BLC has also reduced the number of times that the soil is tilled, which has improved soil structure for better water infiltration. This combination of annual cropping, minimum soil disturbance, and increased soil cover nearly eliminates overland flow and soil erosion. In addition, some areas near streams in these dry croplands are used for irrigated alfalfa and grass hay, and some of the steeper areas too erodible for tillage are now used for seasonal or occasional grazing. All of these practices would continue throughout the term of the HCP.

BLC also utilizes grassed and buffered waterways as a back up for filtering sediment that could originate from fields during extreme weather circumstances, including non-irrigated lands that make up the majority of the company's farming operations. Necessary waterway width for these areas was determined years ago by the Farm Services Administration (FSA) as part of the Farm Bill, and is on file at the FSA office in Dayton. Widths of these grassed waterways meet the requirements of the Farm Bill Conservation Plan, and were determined to be necessary for prevention of gully/channel erosion through design consideration of soil characteristics, contributing watershed area, upslope land use and management practices, precipitation and climatic characteristics, upland slope, channel slope, and other factors. Widths of these waterways therefore typically vary from approximately 20 to 40 feet. As noted elsewhere in the

document, a number of areas of BLC's ownership are enrolled in either the "Conservation Reserve Program" (CRP) or the "Conservation Reserve Enhancement Program" (CREP). Both are administered by the USDA Farm Service Agency, with technical support from the Natural Resource Conservation Service. The CREP focuses on conservation practices in riparian areas, while the CRP includes erodible farmlands that are planted to a perennial cover crop and "banked" for a 10-year period.

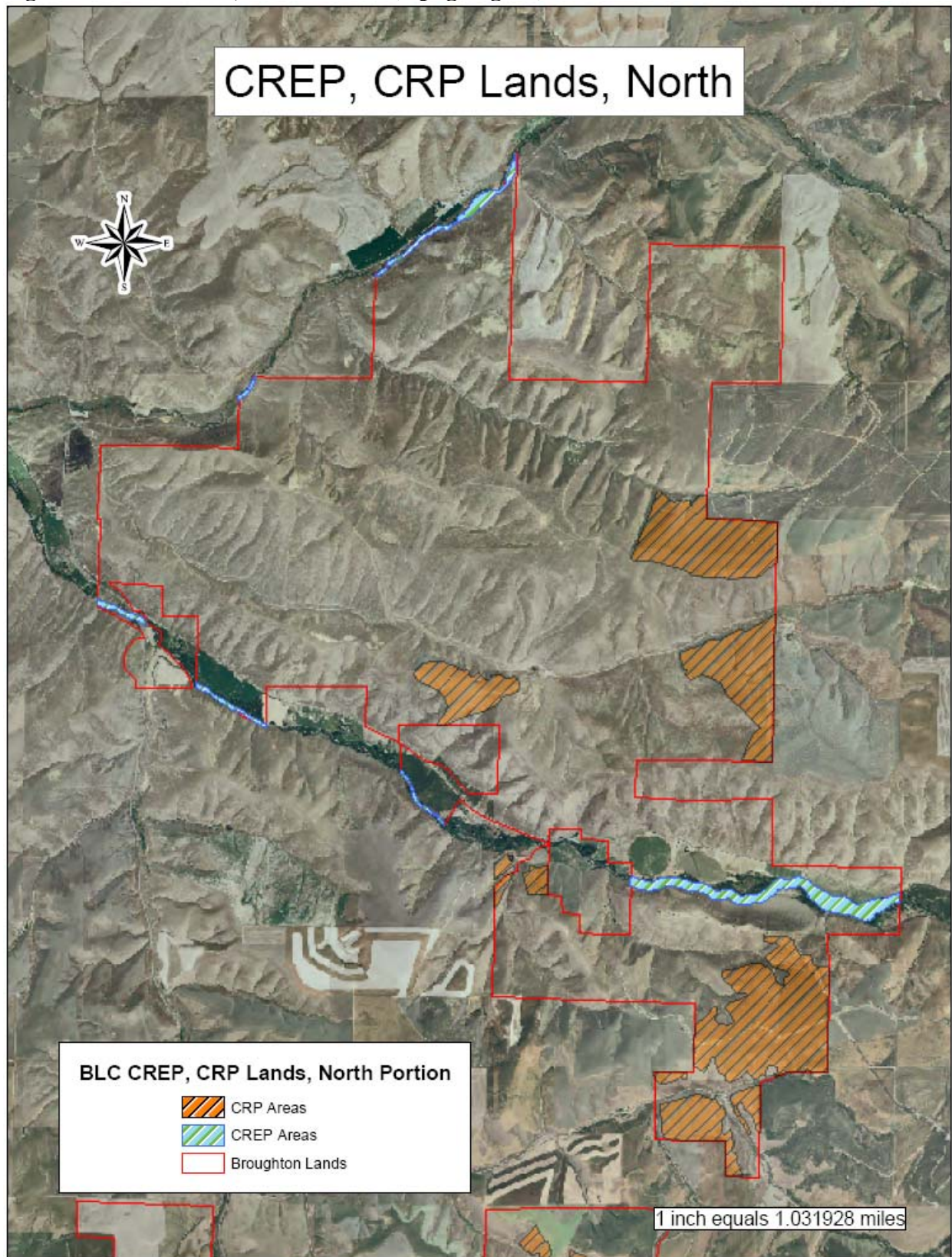
The most significant effect of enrolling lands in either project is to reduce sediment delivery. CRP lands are not farmed annually, so sediment delivery from them is minimal, as opposed to lands that are continuously tilled. While the cover crop may benefit some upland species, there is no little direct benefit to aquatic or riparian species from CRP enrollment, other than some reductions in sediment delivery. However, in CREP areas, riparian areas are fenced and removed from both grazing and farming. This not only reduces direct delivery of sediment from these areas, but also allows the re-establishment of riparian vegetation (USDI 1998; Beschta 1997; Keller et al. 1978).

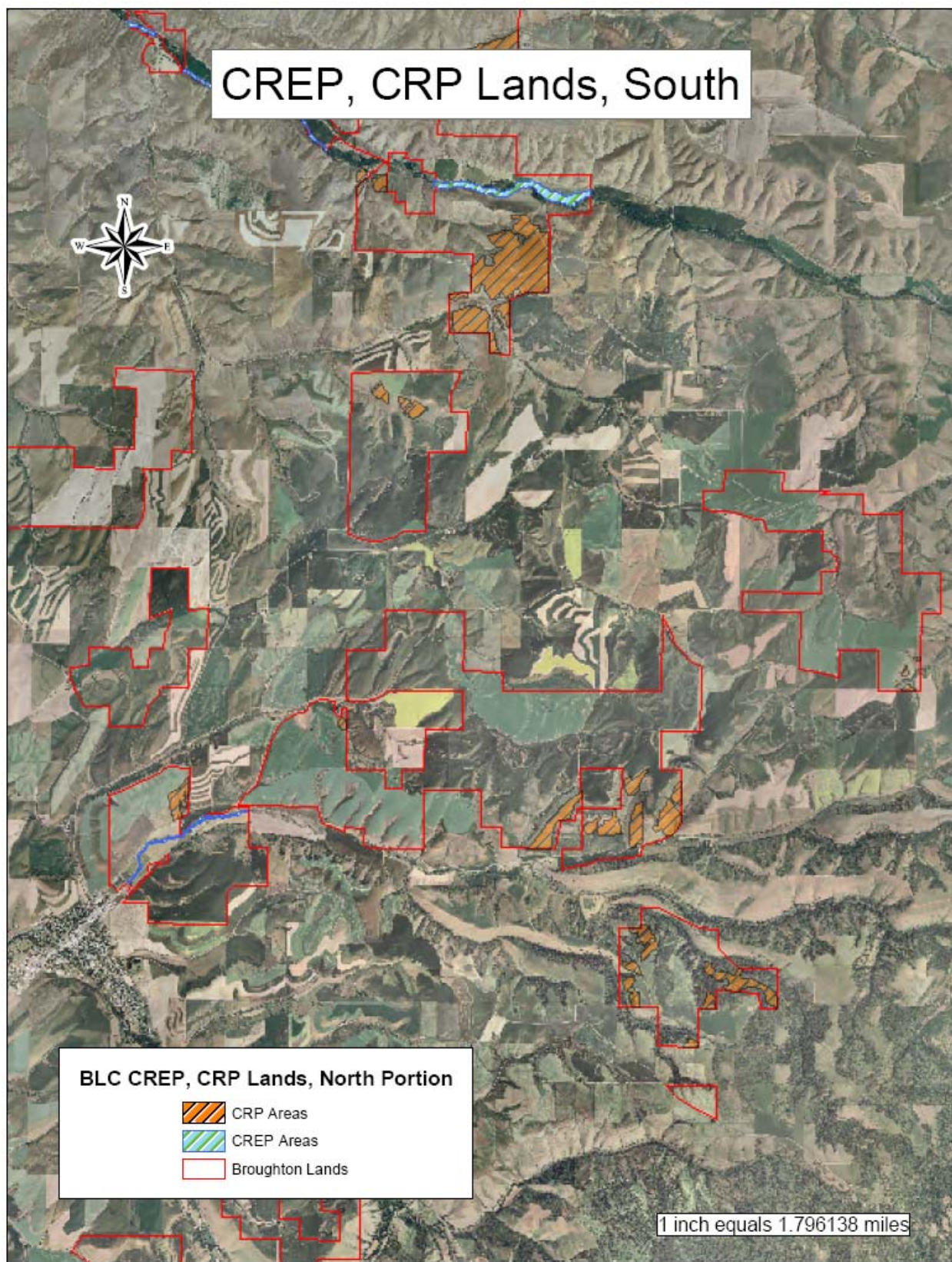
Enrollment in the CRP is for ten years, while CREP enrollment is for 15 years. During this time, landowners, including BLC are paid an annual "rental" for the lands placed in these conservation reserves. At the end of the contract period, BLC may elect to either re-enroll these lands for another contract term or change their use and management. The need for such decisions is a foreseeable "changed circumstance". Nevertheless, BLC proposes to treat riparian areas consistent with its CREP and CRP commitments that exist at the time of HCP implementation for the life of the HCP. Table 6 summarizes BLC's current and possible CREP contracts, while Figure 4 shows the location of these lands.

Table 6. BLC CREP Lands and Practices

<u>Area</u>	<u>Status</u>	<u>Acreage</u>	<u>Renewal Year</u>	<u>Conservation Practices</u>
Pataha Creek	CREP, 2001	39	2016	Fenced, trees planted, water developments
Tucannon #1	Considering CREP	17		Fenced, trees planted, water developments
Tucannon #2	CREP, 2006	30	2021	Fenced, trees planted, water developments
Tucannon #4	CREP, 2001	126	2016	Fenced, trees planted, water developments
Patit #1	CREP, 2006	30	2021	Fenced, trees planted, water developments
Patit, #3	CREP, 2003	19	2018	Fenced, trees planted, water developments
Robinson Fork	CREP, 2006	Approx. 400	2021	Fencing, grazing exclusions

Figure 8. BLC's CRP, CREP Lands (2-page figure)





3.4.3 Site Specific and Activity Specific Conservation Practices

3.4.3.1 Pentecost Pasture

The Pentecost Pasture borders no perennial or fish-bearing streams. Field's Gulch, which flows only intermittently, is bordered by BLC land for approximately 2.3 miles, but cattle have no access to it, as it is fenced 5 to 50 feet from the channel. This fence would be maintained so that cattle continue to be excluded from the channel. Additional existing fences within the pasture would be used to facilitate rotation and rest of various areas to maintain vegetative density and soil conditions. Grazing would normally not take place during the late summer and fall.

Monitoring measures for the Pentecost Pasture would report the condition of the fence and its continuous ability to exclude cattle from the channel of Field's Gulch. This fence is directly adjacent to the county road used by BLC managers throughout the grazing season and would be monitored concurrent with normal management activities throughout the course of the grazing season. In addition, the fence condition would be thoroughly and formally reviewed at the beginning and near the end of each grazing season, and the results of both the formal and "opportunistic" monitoring would be reported to the federal agencies annually.

In response to these monitoring activities, all occurrences of fence disrepair that could allow cattle to enter the channel would be repaired at the time of detection or within three days of detection.

3.4.3.2 Pataha Creek

Grazing was eliminated from all BLC lands bordering Pataha Creek (north of Highway 12) lying between the Highway and the stream in 2001, and will remain eliminated for the term of this HCP. This provides a grassland buffer of width in excess of 100-feet plus a riparian vegetated community along the channel within the 30 to 50 foot-wide zone with moisture conditions that support riparian vegetation for a linear stream distance of approximately 2.6 miles. In addition, a well was developed and maintained to provide an upland water source, and there are no live stream watering spots. Vegetation within the area is native and nonnative grass with exception of relatively young willow clumps that occur adjacent to the stream. Areas adjacent to the stream were planted to cottonwood and willow in 2001. These areas occupying the inner stream terrace and stream banks can be expected to rapidly develop a richly vegetated and diverse riparian vegetative community consisting of willow, cottonwood, dogwood, hawthorn, and other native species (USDI 1998; Beschta 1997; Keller et al. 1978).

Additional existing fences within the Pataha pasture areas south of Highway 12 would be used to facilitate rotation and rest of various pastures to maintain vegetative density and soil conditions. Grazing would occur over the entire year under this management practice. Areas that are dryland farmed within the Pataha Block would remain separated from streams; ephemeral draws, where they now occur within farmed areas, would continue to be managed as grassed waterways. BLC commits to maintain these grassed waterway areas in their current condition for the life of the HCP.

Monitoring measures for Pataha Creek will report the condition of the fence and its continuous ability to exclude cattle from the lands north of Highway 12. Monitoring will occur prior to seasonally placing cattle in this area, and will occur at no less than weekly intervals throughout the season this pasture is used.¹⁰ In addition, monitoring measures are intended to verify that streambanks and the riparian area become stabilized and vegetated with grass, brush, and tree species. Six photo points with GPS documented locations and photo direction azimuths will be distributed along the length of the creek in places where vegetative condition is currently poor and/or soil is exposed and eroding in the riparian area. Consistent with the photo-point approach proposed for monitoring riparian condition, BLC will systematically track the photos for each point by year. BLC will also comment on recovery of the riparian area relative to the goal for that area per Section 6.6 and the Annual Monitoring Summary Report (Appendix 4), and submit this report to the federal agencies for their review annually.¹¹ In addition, NRCS reports that verify compliance with the requirements of the CREP program for this area would be forwarded to the federal agencies annually, along with a report from BLC that verifies effectiveness of the fence.

In response to these monitoring activities, all occurrences of fence disrepair that could allow cattle to enter the channel would be repaired within three days of detection. Rapid development of a brush and tree riparian community is expected to occur given results for these sorts of wet riparian environments reported within the literature and results observable for nearby areas of Pataha Creek (USDI 1998; Beschta 1997; Keller et al. 1978). Currently there are adequate amounts of tree species and shrubs to begin this process. In the unlikely event that the riparian area does not develop into continuous brush and tree vegetation, it will be treated as an unforeseen circumstance, and management measures to correct the condition will be discussed by BLC and the federal agencies.

Grass waterways surrounding headwater ephemeral channels within the Pataha Block currently accomplish their intended purpose; to control channel erosion. BLC assesses the condition of each of these areas throughout the spring, summer, and fall as it farms the fields adjacent to them. Any erosion problems would be promptly reported to the agencies and treated to eliminate them immediately by reshaping and reseeding affected areas. Future FSA inventories of these areas that assess their performance would also be forwarded to the federal agencies as such inventories occur. Any locations identified within these inventories that have begun to erode unacceptably (and none are currently known or expected in the future) would be treated within 6 months of detection in order to arrest the erosion.

3.4.3.3 Tucannon River

All pumps used by BLC to withdraw water from the Tucannon River for irrigation will have updated intake screens installed and maintained to currently applicable criteria for bull trout,

¹⁰ The fence in question borders Highway 12; Broughton will not let this fence be in disrepair, as it cannot at any time allow cattle to wander onto this highway.

¹¹ Per Section 2.7 of this HCP, the goal for these areas is “maintenance of good conditions and improvement of conditions where needed for provision of riparian functions as they affect aquatic habitat elements of sediment, shade, nutrients and woody debris.

steelhead, or chinook, and would do so within one year of receiving notice of the change from USFWS or NMFS to minimize intake of fry and juvenile fish.

Block #4 - BLC's lands bordering the river to the north of Block #4 in Section 1 are flat, irrigated, valley bottomlands that are fenced and separated from richly developed riparian areas that border the river. Width of the existing buffer exceeds 100-feet in some areas, and is as narrow as approximately 30-feet in others. The riparian area that occupies the entire floodplain to the south of the river in this area abuts a steep valley wall slope with grazing lands on the plateau lands above. BLC believes that the important riparian functions of maintaining bank stability, controlling erosion, filtering sediment, maintaining shade and the potential for recruiting large woody debris are met by the existing protected buffers on either side of the river in this reach.



New pumps with 3/32nd inch screens were installed in 2003.

An important management practice to maintain the functions of this riparian area is BLC's management of the cattle. While the riparian area to the south of the river is not fenced, BLC feeds the cattle on the ridge top, away from the Tucannon River. Supplemental feeding is only necessary in the winter months. During periods of particularly harsh winter weather, the cattle may seek shelter in the riparian area for short periods. However, there is very little winter forage in the riparian area, and the supplemental feed remains on the ridge top. Because of the dense brush and the natural terrain on the south side of the river, there are only two places where it is possible for the cattle to access the bottomlands. Narrow trails at these two locations lead down the south slope to the river. The river crossings are shallow cobble-dominated riffles with stony, stable banks surrounded by well-developed alder, cottonwood, and brushy riparian forests. New watering sources located remote from the river are planned to further reduce cattle use of the bottomlands.

Bull trout spawning is unlikely, but it is possible that Steelhead or Chinook redds could occur in these Tucannon River fords in future years. In response, BLC agrees that if redds within these fords are found through WDFW surveys or other biological surveys or inspections (including those discovered by BLC employees), BLC would consult with the Services and take appropriate action to minimize impacts.

The objective of riparian area monitoring for Tucannon Block #'s 1 through 4 is to verify that the existing riparian area width and vegetative characteristics remain in their currently good condition for the life of the HCP. Accordingly, fence effectiveness at excluding cattle from riparian areas would be monitored during the normal course of management activities whenever cattle are in these blocks, and fences would be repaired immediately whenever necessary to remain effective. In addition, GPS-located photo points will be located at two locations representative of riparian conditions in each management block with photos taken annually. Photo points within Block #4 would be purposefully located in cattle access and stream crossing areas to verify that affects upon channel banks and vegetation remain minor. In the unlikely event that riparian condition in any of BLC's Tucannon River ownership blocks deteriorates, the condition would be treated as a changed circumstance, and management measures to correct the condition, such as fencing would be implemented.

Regarding monitoring of irrigation pump screens, BLC will inspect all pump screens at the beginning of the irrigation season and weekly during operation, and will report their condition and any necessary maintenance needs and activities to the federal agencies. In addition, these pump screens would be maintained and repaired during inspection and/or prior to seasonal usage.

3.4.3.4 King/McGee

These are dry-farmed croplands, with approximately 600 acres that are grazed. This area is drained only by ephemeral and intermittent tributaries to the headwaters of Willow Creek and the Tucannon River where no specific conservation actions beyond BLC's existing minimum till and grass waterway buffers, which would be maintained for the life of the HCP, are proposed.

Monitoring measures for the King/McGee, Beard, Romaine, Whetstone, and Johnson Blocks will include visual verification multiple times per year to ensure that the grass waterway buffers are being maintained to prevent gully/channel erosion. BLC will also establish, at minimum, one GPS-located photo-point per parcel to demonstrate continuance of the existing favorable conditions. Situations where channel beds or banks are eroding will be documented by BLC and submitted to the federal agencies annually. In the unlikely event that erosion develops in a waterway, the condition will be treated as needed to eliminate the erosion, and the treatment reported to the federal agencies. Moreover, an additional photopoint would be established at the treated location with photos taken annually to verify treatment effectiveness.

3.4.3.5 Beard Block

These are dry-farmed croplands drained only by ephemeral and intermittent tributaries to the headwaters of Willow Creek. No specific conservation actions beyond BLC's existing minimum till and grass waterway buffers, which would be maintained for the life of the HCP, are proposed.

3.4.3.6 Romaine Block

These are primarily dry-farmed croplands with small amounts of rangeland drained only by ephemeral and intermittent tributaries where no specific conservation actions beyond BLC's existing minimum till and grass waterway buffers, which would be maintained for the life of the HCP, are proposed.

3.4.3.7 Whetstone

These are dry-farmed croplands with smaller amounts of hay and alfalfa in the bottomlands bordering Whetstone Creek, an intermittent non-fish bearing stream. BLC proposes to add rock surfacing to the farm access road where it approaches the stream in section 5. No additional specific conservation actions beyond BLC's existing minimum till and grass waterway buffers, which would be maintained for the life of the HCP, are proposed for this block.

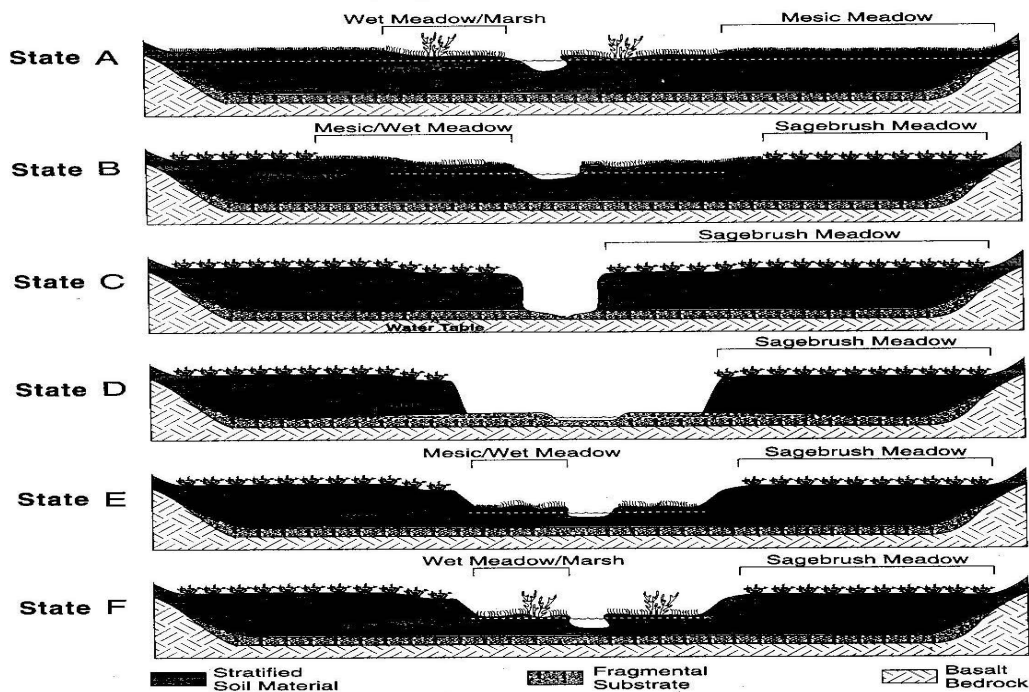
3.4.3.8 Patit Creek

Block #1 - This is irrigated pasture bordering both sides of Patit Creek. Both sides of Patit Creek were fenced in 1991, and riparian vegetation has and continues to develop within that area. However, in some areas, the fence is located immediately adjacent to vertical and poorly to non-vegetated streambanks. Patit Creek within Block #1 has progressed through states A through C to states D and F, as depicted in Figure 9, depending on the exact location within the stream reach, extracted from the BLM's Proper Functioning Condition Guide (USDI 1998).



Broughton has moved this fence back from the top of the current streambank, creating an 85-foot wide buffer on each side of the stream. Over time, this bank will stabilize, with trees and shrubs growing in the stream bottom and along the lower bank.

Figure 9. Succession of States for Alluvial/non-graded Valley-bottom Type (from USDI 1998).



It is our interpretation of watershed conditions and development history that progression from State A followed initial agricultural development in the late 19th to early 20th century and likely had progressed to State C by the 1930s when the CCC channel erosion control structure was installed.¹² The channel has since recovered to Stages E and F, although outer floodplain escarpments in extensive areas remain near vertical and without vegetation. The new ordinary “inner” channel incised within the stream’s new floodplain averages 9-feet in width, with the floodplain reestablished between the bluffs averaging 85-feet wide, including the channel. The escarpments are 6 to 12 feet high, averaging approximately 8 feet. Watershed area contributory to Patit #1 is 47 square miles. Discharge for the 100-year flood calculated using USGS regional flood frequency procedures is 2,750 cfs. Hydraulic capacity of the channel in this reach is 5,340 cfs and is oversized due to historic downcutting and channel widening. The new floodplain between these escarpments was revegetating naturally to willow, hawthorn, dogwood, and cottonwood, but was also supplemented with plantings of willow and cottonwood in 1999. Vegetation is currently dominated by dense, continuous, reed canary grass (*Phalaris arundinacea*) and other introduced grass species, with willow and cottonwood increasing in size.

The conservation goal for Patit # 1 is to provide full riparian function for the key aquatic attributes of sediment filtering, nutrient filtering, shade, and large woody debris. To achieve this objective, BLC would maintain the fences along Patit Block #1 to exclude cattle from the stream and to allow continued development of riparian vegetation. BLC also proposes as an HCP conservation measure to widen the riparian zone by relocating the fence in areas of vertical

¹² Areas surrounding the channel at Patit Creek are irrigated pasture, not sagebrush as depicted in the figure.

banks to a width that would accommodate gradual and natural regrading of the banks to a 1:1 slope (45 degrees), which approximates the natural angle of repose for these stream bank materials. This would widen the total riparian area to average approximately 92-feet in width, and would provide a vegetated riparian width on each side of the channel that averages 46-feet. Vertical escarpments can be expected to naturally revegetate rapidly as they regrade given the abundance of subsurface and surface water from the surrounding irrigated areas and surface sprinkler waters that most of these areas would continue to receive.¹³

An old erosion control structure installed in the 1930's by the federal Civilian Conservation Corps that posed a partial migration barrier located near the upstream end of the block was removed from Patit Creek in 2001 in cooperation with the WDFW. BLC has also applied crushed rock to a steep, old, formerly native-surfaced farm access road that parallels an ephemeral tributary of Patit Creek in section 5. Consistent with the assumption that riparian areas would rapidly develop brush and tree riparian vegetation when left undisturbed, BLC proposes to verify that the fence has been relocated within 1 year of the effective date of this HCP.

BLC would also monitor the condition of the fence and its continuous ability to exclude cattle from the riparian zone. In addition, monitoring measures are intended to verify that streambanks and the riparian area become stabilized and vegetated with grass, brush and tree species. To accomplish this monitoring objective, two photo points with GPS documented locations and photo direction azimuths will be distributed along the length of the creek in places where vegetative condition is currently poor and/or soil is exposed and eroding in the riparian area.

This road has been surfaced with crushed rock to reduce sediment in the adjoining stream.

In response to these monitoring activities, all occurrences of fence disrepair that could allow cattle to enter the channel would be repaired within 3 days of detection. Rapid development of a brush and tree riparian community is expected to occur based on other results of wet riparian environments reported in the literature (USDI 1998;



¹³ These widths will provide full to nearly full riparian function consistent with minimization of take. Relevant to all reaches of Patit Creek, Castelle et al., 1994, report that 85% of **sediment** from upland surfaces on 7 to 12% slopes was trapped within riparian areas within 30 feet. Regarding **nutrients**, they also recount study results where, during simulated 1 to 10-year storms, vegetated filter strips (VFSs) of 15 and 30-foot width trapped 90 and 96 to 99.9% of NH₄-N, NO₃-N, and PO₄-P. Regarding **large woody debris**, studies of illuviated streams by Murphy and Koski (1989), Martin et al (1998), and McKinley (1997) demonstrate that approximately 90% of all wood recruitment originates from trees standing within 30% of total effective tree height--approximately 30-feet for Patit Creek and these lowland sites. Regarding **shade**, and depending on the specific characteristics of the vegetation and stream, 45 to 100% of total stream shade is provided within 20% of total tree height, with 70 to 100% provided within 40% of tree height (Brososke et al (1997); Brazier and Brown (1973); Steinblums et al (1984)).

Beschta 1997; Keller et al. 1978) as well as recovery results observed for other nearby reaches of Patit Creek and other areas of BLC ownership impacted by historic land use disturbances. However, in the unlikely event that the riparian area does not develop near continuous brush and tree vegetation, it would be treated as an unforeseen circumstance, and management measures to correct the condition would be discussed by BLC and the federal agencies.

Block #2 - Well-developed riparian areas border both sides of the stream. BLC does not irrigate lands adjacent to Patit Block #2. The entire area to the south of the stream is riparian between the stream and a road that leads to BLC's ranch headquarters road. The riparian area to the north averages 50-foot wide to BLC's property line, and the area to the south between the stream and the road averages 150 feet wide. These riparian areas are not fenced and are not accessible to cattle. Grazing has not occurred in the area within memory of ranch employees interviewed. BLC would continue to maintain these riparian areas grazing-free on both sides of the stream in this block. Vegetation bordering Patit Creek through Block #2 is dominated by willow brush that virtually hides the stream from view in nearly all locations. Full riparian function is again the goal for this reach of Patit Creek and would be achieved as the existing naturally established willows mature further.

Monitoring measures for Patit Block #2 are intended only to verify that streambanks and the riparian area remain stable and vegetated with grass, brush and tree species. Two representative photo points with GPS documented locations and photo direction azimuths would be located to verify that existing satisfactory conditions remain and/or improve with time.

Block #3 - The area to the south of this reach of Patit Creek is currently accessed by cattle from the adjacent valley floor pasture, and cattle cross the stream to graze a small area of BLC land to the north of the stream. This area to the north is the site of a Lewis and Clark expedition campsite. BLC will construct a fence between the pasture and the riparian and channel area to the south of Patit Creek for the entire length of this block (1,500 feet), eliminating cattle access to the stream and BLC's lands to the north for the life of this HCP. Offsite watering areas would be developed as necessary, and there would no longer be live stream watering. BLC also proposes that the areas to the north of Patit Creek and south of the county road not be farmed or grazed and proposes that the area be used as an historical site. This area to the north would provide unmanaged upland and riparian area that averages approximately 150-feet in width. To the south of Patit Creek in this block, the fence would be located so that the riparian area averages 75-feet in width between the fence and the ordinary high water mark. Full riparian function is again the goal for this reach of Patit Creek and would be achieved as riparian grass, brush, and tree species further and naturally establish themselves on both sides of the stream.

Consistent with the assumption that riparian areas would rapidly develop brush and tree riparian vegetation when left undisturbed, BLC proposes to verify that the proposed fence has been constructed within 2 years of the effective date of this HCP. BLC would also monitor the condition of the fence and its continuous ability to exclude cattle from within the riparian zone. In addition, monitoring measures are intended to verify that streambanks and the riparian area become stabilized and vegetated with grass, brush and tree species. To accomplish this monitoring objective, two photo points with GPS documented locations and photo direction

azimuths would be distributed along the length of the creek in places where vegetative condition is currently poor and/or soil is exposed and eroding in the riparian area.



Figure 10. This aerial photograph of the lower Patit Creek lands show the relatively narrow width of the riparian area downstream from the ranch headquarters. Here, fences have been moved and the bank allowed to stabilize and revegetate after the date of this photo.

In response to these monitoring activities, all occurrences of fence disrepair that could allow cattle to enter the channel would be repaired within three days of detection. Rapid development of a brush and tree riparian community is expected to occur given results for these sorts of wet riparian environments reported within the literature and results observable for other nearby reaches of Patit Creek and other areas of BLC ownership and streams that have recovered from historic land use disturbances. However, in the unlikely event that the riparian area does not develop near continuous brush and tree vegetation, it will be treated as an unforeseen circumstance, and management measures to correct the condition would be discussed by BLC and the federal agencies.

Block #4 - Although Patit Creek goes dry seasonally in this one-mile long reach, steelhead are known to migrate through it. Patit Creek historically downcut deeply into the valley floor and is sinuous within a newly established inner terrace floodplain. Currently the stream has reestablished a narrow (3.4-foot average width) active channel within an inner riparian terrace (27-foot average total width) that is generally heavily vegetated with reed canary grass, or brush with grass understory. This inner terrace is generally bordered by an escarpment (generally 3 to 10 feet in height) formed when the stream downcut many years ago. In several areas, the escarpment remains unstable and barren, while in others it is richly vegetated with brush species.

Currently, the riparian area bordering Patit Block #4 averages 39-feet in width to the north, and 52-feet in width to the south, as represented by ten transects located at 500-foot intervals measured in 2002, as shown in Table 7. To stabilize escarpments and reestablish riparian brush and tree species on exposed surfaces and on the upper terrace surfaces, BLC proposes to establish a no-farm buffer between its fields and these escarpments that would be a minimum of 10 feet wide, and to provide a total riparian buffer width that would average over 50-feet wide on each side of the stream (Figure 11). Table 7 illustrates how width of the upper terrace buffer would be increased to achieve both the 10-foot minimum and the minimum 50-foot riparian buffer width.¹⁴

Ponderosa pine and/or other suitable tree species would be planted within suitable areas of the buffer. This width of riparian area, once densely vegetated, would provide for full stream shade, woody debris recruitment, bank stability, and erosion control. Slopes farmed adjacent to these riparian areas are flat to very nearly flat, and coupled with excellent erosion control provided by minimum till conservation practices, provide good sediment and nutrient filtering. Full riparian function for all of these attributes is the goal and is expected to be rapidly achieved as riparian areas are further invaded by brush and tree species.

The watershed area contributory to Patit #4 is 12 square miles. Discharge for the 100-year flood calculated using USGS regional flood frequency procedures is 1,320 cfs. Hydraulic capacity of the channel in this reach is 1,400 cfs.

¹⁴ Per HCP requirements, upper terrace width would in all cases be adjusted as necessary to a minimum width of 10 feet, as illustrated by the table. Widths of additional areas may also need to be increased as illustrated by the table to achieve a total riparian width of 50-feet for each side of the stream. However, the locations adjusted for total width in Table 8 (adjusted widths shown in bold font) are for illustration only. Actual location of width adjustments must be determined on the ground following adoption of the HCP.



Figure 11. The narrow portions of the riparian area of Patit Block #4 in the lower third of this aerial photo will be expanded to average 50-feet on both sides of the stream.

Table 7. Patit # 4 Stream Buffer Survey 03/28/01

Transect	Left Upper Terrace Rip Veg Width	Left Upper Terrace Rip Veg Width	Left Low Terrace Width	Total Riparian Left	Total Riparian Left	Active low water Channel Width	Right Low Terrace Width	Right Up Terrace Rip Veg Width	Right Up Terrace Rip Veg Width	Total Riparian Right	Total Riparian Right
		HCP-Adjusted			HCP-Adjusted				HCP-Adjusted		HCP-Adjusted
1	13	40	12	25	52	3	10	70	70	80	80
2	1	30	12	13	42	4	17	60	60	77	77
3	24	24	35	59	59	5	5	120	120	125	125
4	48	48	20	68	68	3	2	0	10	2	12
5	6	10	19	25	29	2	5	65	65	70	70
6	0	10	28	28	38	3	5	19	19	24	24
7	14	14	33	47	47	3	5	62	62	67	67
8	9	30	15	24	45	3	7	90	90	97	97
9	18	40	2	20	42	3	18	26	26	44	44
10	65	65	15	80	80	5	6	6	10	12	16
Mean	19.8	31.1	19.1	38.9	50.2	3.4	8	51.8	53.2	59.8	61.2

3.4.3.9 Cougar Canyon



Cougar Canyon and other steep breaklands were planted with Ponderosa Pine seedlings. This young stand was killed by the fire of 2006, but will be replanted.

These are steep breaklands where trees have been planted and grazing restricted for several years. Minor amounts of land are dry-farmed. BLC may consider seasonal grazing and timber harvests at some future date, but no specific conservation measures are planned for this area. Trees within this area would not reach harvestable size during the term of the HCP. It is possible that there would be a need to thin these stands during the term of the HCP.

If so, temporary roads and the use of mechanical harvesters may be needed, all of which would be governed by the Forest Practice Act rules. Moreover, in the event that these July 2001 regulations are modified, BLC would provide and implement equivalent or greater habitat protection. No other measures are necessary for this HCP within the area. Regarding grazing of the area, BLC and the agencies would consider future grazing proposals as a changed condition, and would manage it as described in Table 12.

As described in section 6.1.2.1, part of this area burned in 2006. The BLC plans to replant trees and manage as described above.

3.4.3.10 Johnson Place

These are dry-farmed croplands drained only by two ephemeral draws. No specific conservation actions beyond BLC's existing minimum till and grass waterway buffers, which would be maintained for the life of the HCP, are proposed for this block.

3.4.3.11 Payne Hollow

These are dry-farmed croplands with minor amounts of seasonal grazing that border ephemeral and intermittent tributaries of Payne Hollow an intermittent non-fish bearing stream. BLC planted trees in the steeper areas approximately 20 years ago to recover previously eroded areas associated with historic grazing and farming practices. BLC proposes to maintain these areas in trees, and plans to commercially thin some areas at some time during the life of this HCP. No additional conservation actions beyond BLC's existing minimum till and grass waterway buffers, which would be maintained for the life of the HCP, are proposed for this block.

All potential future forest practices activities, including commercial thinning, that may occur within the area would be conducted in compliance with the Washington Forest Practices Rules, and no other measures are necessary for this HCP within the area.

As described in section 6.1.2.1, part of this area burned in 2006. The BLC plans to replant trees and manage as described above.

3.4.3.12 Robinson Fork

Forest road construction, harvesting, and associated forest management activities are regulated by the Washington Forest Practices Act (WFPB 2001), including salvage harvests of fire-killed timber. In the event that the current rules (July, 2001) and regulations are modified, BLC would provide and implement equivalent or greater habitat protection. The Act's implementing rules address riparian management and provide for full riparian function for wood, shade, sediment and other important functions important for the aquatic environment of forestlands (WFPB 2001). In addition, a WDNR watershed analysis was completed in 1998 (WDNR, 1998). This assessment supplements the Act's rules with a set of geographically specific "prescriptions," which under state law, become mandatory rules for the areas to which they apply within the watershed. The key rules and prescriptions that now regulate BLC management of their forestlands in the Robinson Fork include:

- New roads on slopes that exceed 60 percent, which have the potential to deliver sediment to streams, must utilize full bench construction, including end hauling, unless a site review determines no delivery potential (WFPB 2001).
- All forest roads must be included in a road maintenance and abandonment plan by the year 2005, and are subject to DNR approval (WFPB 2001).
- Skid trails running parallel or nearly parallel to streams must be located at least 30-feet from the ordinary high water mark of all perennial and seasonal streams (WFPB 2001).
- Two ancient deep-seated landslides occur on BLC ownership. No roads can be constructed on slopes over 50 percent within those areas, unless a geotechnical report shows no increased risk of slope failure and is approved by the WDNR (1998).
- As required by the new Forest Practices Act rules (WFPB 2001), BLC prepared and submitted to the WDNR for their approval a detailed reconstruction plan for the road that parallels the Robinson Fork and for the portions that will be abandoned as a result of damage from the 1996 flood. This plan has been reviewed and fully approved by the WDNR and is incorporated as a set of conservation measures for this HCP (see Appendix 2).

The Washington Forest Practices Act riparian management rules for eastern Washington prohibit removal of any tree located within 75-foot horizontal distance of a bull trout habitat stream that provides any shade to that stream. This applies to the entire Robinson Fork within BLC lands

(see Fed. Reg. Vol. 67, No. 230, Friday, Nov. 29, 2002).¹⁵ In addition, the rules prohibit removal of trees within 125-feet of the outer edge of the bank-full channel width (essentially the same as the edge of the stream channel) or from the entire channel migration zone, whichever is wider, where shade is insufficient to maintain water temperature within the state's standards (WFPB 2001). The applicable State standard is currently exceeded for the entire length of the Robinson Fork, with the exception of the uppermost one-mile of stream in Sections 27 and 34, (WDNR 1998).

Removal of trees near fish-bearing streams is further restricted by the 2001 Washington Forest Practices Rules in order to increase long-term large woody debris recruitment. These rules prohibit removal of any trees within a riparian management zone (RMZ) core zone that is within 30 feet of the outer edge of the bank-full channel width or outer edge of the channel migration zone (CMZ), whichever is wider. In addition, tree removal is severely restricted in an additional 70-foot-wide zone that extends 70-feet beyond the outer edge of the core zone, and can only occur in areas where stands have high basal area or are exceptionally dense. Given the conditions found along the Robinson Fork, the rules in effect mean that few if any trees would be removed from within 125-feet of the stream channel edge during the life of this HCP.

Application of the Washington rules is exceptionally complex and depends on the site specific stream reach and adjacent stand conditions found at the time a landowner applies for a permit to harvest, therefore the reader is referred to the rules found at www.wa.gov/dnr for more details.

Regarding erosion and sediment delivery, the WDNR South Fork Touchet River Watershed Analysis (1997) stated that erosion and sediment delivery from BLC's Bottom Road was related to vehicular traffic on native-surfaced roads, inadequate and poorly placed drainage structures, overtopping of the road prism in specific road segments, and storage and delivery of sediment at log deck bridges. In response to these findings, BLC has developed a plan, the "RMAP" to formally abandon and relocate the lower 2 miles of the Bottom Road. Implementation of this plan would eliminate logging truck traffic and logging machinery uses for the remainder of the Bottom Road, develop new road drainage features designed to limit road erosion and sediment delivery, limit road use to light management and recreational vehicle traffic, restrict public access to the road and entire block by maintaining locked gates, and eliminate all but one bridge (of an original 13 that washed out in 1996), replacing them with 5 or 6 rock fords. These RMAP measures were developed cooperatively with the WDNR, were submitted to the WDNR for formal approval and subsequently approved by the WDNR as the formal road maintenance and abandonment plan required by the forest practices rules. This plan and its implementation are incorporated as a conservation measure within this HCP (see Appendix 2).

¹⁵ An explicit goal of the Forest and Fish Report, presented to the Forest Practices Board and the Governor's Salmon Recovery Office in February 1999 and subsequently adopted as forest practices rules in 2001, is "to provide compliance with the Endangered Species Act for aquatic and riparian dependent species on non-federal forest lands." The needs of salmon, steelhead, and bull trout were expressly considered in formulating these rules. Included in the Rules is a bull trout habitat overlay map and provisions to add or delete streams from the map through consultation with a local WDFW fish biologist, affected Tribes, and federal biologists. The local WDFW biologist, Glen Mendel, considers the Robinson Fork as bull trout habitat. BLC agrees that the Robinson Fork will be treated as a bull trout stream subject to the special rules for bull trout waters detailed in the 2000 Washington Forest Practices Rules (WFPB 2001).

The use of the fords during times when fish may be spawning in Robinson Fork poses a very site and time specific issue. It is possible that fish could choose the gravel of a ford or the area immediately below them as a spawning site. Under such circumstances, use of the ford, or sediment dislodged from its use, could damage eggs or emerging fry. If BLC uses the road and the fords during times that fish would likely be spawning, then the company will visually inspect the ford and the area immediately below it (approximately 10-feet downstream of the lower edge of the ford) and refrain from using it until the spawning season is past. While redds are generally quite visible, the company may seek the advice of the Washington Department of Fish and Wildlife or other competent biologists if there is any doubt about the existence of redds or how long they might be in use.



Parts of this road along Robinson Fork will be kept for administrative use, but most of it will be relocated higher on the slope. It will no longer be used for log hauling. The management plan for this road has been approved by the Washington Department of Natural Resources.

Table 8. Summary of Resource Conditions and Management Needs

Tract Name	Acres	Stream Conditions	Riparian Conditions	Current Uses	Resource Problems	Management Action and/or Objective
Pentecost Pasture	2,717	Mainly ephemeral or dry draws	Dry brush types	Winter, spring grazing	Invasion of exotic and toxic species in upland pastures	Continue to isolate Field's Gulch from cattle by maintaining the effectiveness of the existing fence. Maintain or improve rangeland conditions
Pataha Creek	8,000	Incised deep channel	Developing tree and shrubs	Grazing	Channelization, lack of vegetation. Invasion of exotic and toxic species	Place area (> 100 feet wide and 2.6 miles long) between the stream and Highway 12 in the CREP program and eliminate grazing therein. Develop well and water source to S of 12. Maintain or improve rangelands with rest and rotation pastures and fences. Maintain grassed waterways in cropland areas
Tucannon River	4,500	Large fish-bearing stream			¼ inch screens on 12 pumps	Screen all pumps to newest NMFS standards. (3/32 screens installed 2003)
Block #1		Richly forested in most areas. Scoured and channelized in some	Deciduous forest or grass/forb	Irrigated pasture	Past flood damage	Maintain existing riparian areas which generally are > 100 feet wide bordering BLC. Allow flood-damaged area to revegetate naturally and with past planting
Block #2			Dense grass	Irrigated alfalfa	None	Maintain existing fences and riparian vegetation. Width of dense riparian vegetation averages > 75-feet
Block #3		Stabilized by large boulders	Fenced, deciduous forest	Irrigated alfalfa	None	Maintain existing fences and riparian vegetation. Width of dense riparian vegetation averages > 75-feet

Tract Name	Acres	Stream Conditions	Riparian Conditions	Current Uses	Resource Problems	Management Action and/or Objective
Block #4			Fenced, deciduous	Irrigated pasture	None	Placed in CREP 1n 2001. Build two watering devices in the uplands. Construct fences 75-feet or more from the ordinary high water mark. Plant area within fences to trees and shrubs
King/McGee	1,800	Ephemeral and intermittent	Grassed waterway	Dry farming/ grazing	None	Maintain grassed waterways in croplands
Beard Block	1,568	Intermittent	Grassed waterway	Dry farming	None	Maintain grassed waterways in croplands
Romaine Block	1,792	Ephemeral and intermittent	Dense brush in canyon	Dry farming	None	Maintain grassed waterways in croplands
Whetstone	916	Intermittent	Grassed waterway	Dry farming	Road erosion	Add rock surfacing to road in sec. 5. Maintain grassed waterways
Patit Creek	7,032					
Block #1		Down-cut, channelized	Stable inner floodplain bounded by sometimes vertical and unstable banks. Riparian shrubs developing in many areas	Irrigated pasture	Vertical/unstable banks; narrow	Maintain fences and riparian vegetation. Widen fenced area to allow banks to regrade to 1:1 and provide a riparian area that averages approximately 92-feet wide. Add rock to BLC road south of Patit in Sec.20. Remove old CCC structure in coop with NRCS and WDFW
Block #2		Perennial	Stable, well developed	Irrigated pasture	None	Maintain fences and riparian vegetation. Riparian width to the north averages 50-feet, and to the south 150-feet

Tract Name	Acres	Stream Conditions	Riparian Conditions	Current Uses	Resource Problems	Management Action and/or Objective
Block #3		Down-cut, channelized	Highly variable.	Irrigated pasture	Some cattle use that disturbs banks; some wide/unstable channel	Fence the entire block (1,500 feet) to south and eliminate grazing to north to allow development of riparian vegetation and stable channel. Riparian and unmanaged upland width to the north would average 150-feet. Riparian area width to the south would average 75-feet
Block #4		Downcut, narrow, stable to unstable banks	Shrubs, grass and small trees	Dry farming	Farmed to edge of banks	Establish wider riparian area and revegetate bare soil areas. Plant pine and other suitable trees. Riparian area width currently averages 40-feet and would widen to just over 50-feet
Cougar Canyon	1,250	Intermittent	Stable with brush and small trees	Dry farming/Conservation areas	None	Maintain existing conditions
Johnson Place	917	Ephemeral and intermittent	Grassed waterway	Dry farming/grazing	None	Maintain grassed waterways
Payne Hollow	2,400	Ephemeral and intermittent	Grassed waterway	Dry farming/grazing	None	Maintain existing fences and riparian areas
Robinson Fork	5,162	Braided, downcut, flood effects	Loss of riparian vegetation in some areas, road in stream bottom, lack of soil in scoured areas for vegetative regrowth	Timber, with seasonal grazing	Time is needed to restore channels and riparian areas from flood effects*	Relocate and abandon stream bottom road in lower end and restrict road use in remaining areas near Robinson Fork. Riparian width is variable as dictated by local morphology, but in no case can trees be harvested within 75-feet of the Robinson Fork

* Management adjusted after 2006 fire. Will enter Robinson Fork riparian areas into CREP and exclude cattle from the riparian areas, with a goal of developing densely vegetated riparian areas that naturally restrict livestock use. This will be re-evaluated at the end of the CREP contracts, estimated to be 2021.

Table 9. Summary of BLC's Conservation Measures

<i>By Individual Area...</i>				
	Conservation Practice	Target Implementation Date	Cost	Relationship to "Maximum Extent Practicable" Provision
Pataha Creek	Enroll area between stream and Highway 12 in CREP; Develop water source south of Hwy 12	Completed 2003	\$34,000	These measures eliminate all farming and ranching activities near Pataha Creek, stream buffers are revegetating with trees and brush, much of which is planted. No additional measures needed
Tucannon River	Replace pump screens to meet current fish criteria	Completed 2003	\$28,000	These are the current standards required by NOAA Fish and State agencies to eliminate take associated with water intake pumping devices. If criteria changes, adjust screens within one year of notice
	Enroll in CREP; Build two water sources; construct fences and plant trees and shrubs	Completed 2002	\$141,000	Enrollment in CREP ensures minimal to no take by eliminating virtually all farming and ranching activities near Tucannon River. No additional measures needed
	If redds are found in crossings consult with agencies to minimize impact			
Whetstone	Surface road	Completed 2003	\$5,000	Minimizes sediment delivery by reducing erosion to approximately 2% of former quantity while continuing to allow BLC to use this important farm access road

	Conservation Practice	Target Implementation Date	Cost	Relationship to "Maximum Extent Practicable" Provision
Patit Creek				
Block #1	Widen fenced riparian area; Add rock to road in Sec. 20; Remove old CCC dam. Enrolled in CREP in 2005	Fence completed 2005-2006. Road completed 2003. CCC dam removed 2003	\$32,000	See road comment above. The irrigated fields adjacent to Patit 1 are critical to BLC's operations and to other economic uses. Expansion of the riparian zone through upgrading and movement of the existing fence further eliminates grazing and haying impacts to the channel, riparian area and channel "bluffs", allowing these areas to revegetate at an accelerated rate, and providing a high level of riparian area conservation benefit. This is the maximum expansion of riparian area that can still allow the traditional use of the field
Block #2	No additional measures needed	Completed. 1990s		This area of BLC land has been protected for several years (decades); there are no farming, grazing or other BLC land usages of this area
Block #3	Enroll area in CREP. Fence entire block to south a minimum of 75 feet from the OHWM and eliminate grazing to north to allow expansion of riparian area; water developments. Donated approximately 4 acres for historical interpretive site	Completed. 2003	\$19,500	No additional measures needed. See Pataha comments regarding benefits of CREP
Block #4	Realign farmed area to allow riparian area to expand; Plant trees and shrubs as needed to encourage expansion; possibly enroll in CREP	Unknown, but projected for 2012		This is maximum expansion of riparian area that can still allow the traditional use of the field. Riparian area would average more than 50-feet in width, and farmed areas most proximate to stream are flat. Degree of stream temperature, LWD, and sediment buffering would be high relative to 100% of potential

	Conservation Practice	Target Implementation Date	Cost	Relationship to "Maximum Extent Practicable" Provision
Robinson Fork	Relocate and abandon stream bottom road and restrict use; Comply with FPA rules as they exist at time of HCP approval through the term of the HCP	Road relocation and upgrades complete 2007	\$40,000	These are the measures that are economically possible, would protect the riparian area and maintain the traditional use of the Robinson Fork area
	Enroll in CREP	2006		
	Cooperate in WDFW stream surveys or BLC will conduct informal surveys. If redds are found In Robinson Fork at fords consult with agencies to minimize impacts	Ongoing		
	Conduct Fire Salvage: On steeper slopes BLC will contour fall whips and poles every 50 to 60 vertical feet and seed with grass to minimize erosion. Where available, live trees will be left as seed sources for regeneration. Other areas will be replanted with seedling stock	Complete in 2007-2008		
<i>By Land Use and Covered Activity...</i>				
	Conservation Practice	Target Implementation Date	Cost	Relationship to "Maximum Extent Practicable" Provision
Irrigation	Replace all screens with 3/32nd standard mess mesh	Completed 2003	As above	As above
	Enroll 6.4 cfs in water trust to reduce total irrigation use by over 50 percent	Completed 2003		This is a direct benefit to habitat effectiveness and availability within the Tucannon and is the maximum practicable for BLC to continue to use these lands for their traditional irrigated pasture and hay functions

	Conservation Practice	Target Implementation Date	Cost	Relationship to "Maximum Extent Practicable" Provision
Grazing	Develop off-stream water sources fed by a new deep water Pataha well (no withdrawals from Pataha or Patit) in Pataha Creek, Patit #3	Completed 2001-2003	\$83,000	These are the measures that are economically feasible, would maintain the traditional use of the remaining pasture, and ensure full riparian function and conservation benefit
	Enroll lands in Tucannon, Patit and Pataha Creeks in CREP and eliminate grazing within enrolled areas adjacent to streams along with qualifying portions of Robinson Fork		As above	No additional measures needed
	Maintain riparian conditions initially encouraged by CREP for life of HCP			
	Maintain grassed waterways for life of HCP			
	Construct new fences in Patit #3 and #1	Completed 2003, 2007	As above	No additional measures needed
	Attract cows away from streams by salt placement and supplemental feed location			Minimal additional cost
Farming	Surface roads in Whetstone and Patit Blocks	Completed 2004	As above	No additional measures needed
	Remove old dam in Patit Creek	Completed 2003	\$18,000	No additional measures needed
	Maintain grassed waterways for life of HCP			
	Maintain minimum till			

	Conservation Practice	Target Implementation Date	Cost	Relationship to "Maximum Extent Practicable" Provision
Forest Management	Abandon portions of the road in the riparian area of Robinson Fork. Remove two fish barrier culverts	2005-2007. Culverts removed in 2004	As above	This allows the road to be used for administrative purposes but eliminates the preponderance of sediment delivery to the Robinson Fork from BLC lands, and enhances ability of the riparian area to provide LWD and shade as the road narrows from a heavy haul road to a "single track" condition
	Comply with FPA rules in existence at time of HCP approval Enroll qualified portions of Robinson Fork in CREP to exclude grazing and facilitate the establishment of new trees	Completed and will continue 2007		Minimal additional cost Excluding cattle and reforestation area will, over the long term, reduce sediment delivery

3.5 Financial Assurances for the HCP

The BLC HCP proposes to minimize and mitigate the impacts of take of the species covered in the plan through direct expenditures by BLC. These expenditures would represent normal operational costs and would be included in the annual budget for the management of the property. However, in order to assure that adequate funds are available for annual maintenance (Table 10), BLC proposes to dedicate necessary funds from the annual CREP and CRP payments made to the company. These payments represent a commitment under various USDA authorities for annual payments based upon the number of acres that individual landowners have enrolled in either CREP or CRP. The terms of some of the CREP and CRP contracts that BLC now holds exceeds the proposed term of this HCP, thereby providing sufficient funds for its implementation. As shown in Table 9, most of the structural conservation measures have already been implemented. Any additional funds to complete this work will come from a combination of existing conservation programs and from funds to be included as part of BLC's annual operating budgets. At the outset of the development of this HCP, BLC estimated that the direct expenditures from all sources to implement the HCP would total approximately \$327,000. The major items by year and the originally estimated costs or the actual costs for projects already completed are summarized in Table 10. Each year, BLC anticipates reviewing upcoming projects and their associated costs with the agencies as part of the biennial review of the plan and its implementation as outlined in Chapter 4.

Table 10. Schedule and Costs of Mitigation Measures

Project	Year Planned*	Estimated Cost	Source and Estimate of Outside Funds	Annual Maintenance Cost
Replace pump intake screens	2003*	\$28,000	BLC & Columbia Co. Conservation District	\$2,000
Water development - Pataha Creek	2001*	\$68,000	15% BLC, 85% Conservation District & Salmon Recovery Fund	\$2,000
Water development - Patit Creek #3	2003*	\$15,000	\$11,000 BLC \$4,000 CREP	\$500
Fence construction - Patit Creek #3	2002-2003*	\$4,500	40% BLC/60% CREP	\$500
Patit Creek #1	2007*	\$51,000	40% BLC/60% CREP	\$1,000
Patit Creek #4	Est. 2012	\$5,000	40% BLC/60% CREP	
Robinson Fork road abandonment, relocation, repair	2007*	\$40,000	100% BLC	\$2,000
Gravel Whetstone and Patit Block roads	2003-2004*	\$5,000	100% BLC	\$500
Annual monitoring and reporting	Annually and biennially	\$0	100% BLC	\$3,000
Tucannon #4 CREP	2002*	\$141,000	15% BLC, 85% Conservation District & Salmon Recovery Fund	\$4,000
Dam removal Patit #1	2001*	\$18,000	\$5,000 BLC \$8,000 Salmon Recov. \$5,000 Steelheaders	\$0
Robinson Fork CREP	Enrolled 2007*; Work to be completed by 2010	\$165,000	100% CREP	\$10,000

* Denotes projects already completed.

It is possible that low farm prices or limitations to available cost-share programs might necessitate the postponement of some of these expenditures from the year originally anticipated for them. In such cases, there are two possible courses of actions: (1) negotiate changes in the HCP or (2) find alternative sources of funds. BLC is prepared to explore these possibilities if the need arises. Nevertheless, the company would be responsible for completing the work outlined in this document or as amended, regardless of financial contributions from outside sources.

3.6 Monitoring, Response to Changed or Unforeseen Circumstances and Adaptive Management

Section 10 of the ESA requires that an HCP specify the measures the applicant would take to monitor the impacts of the take resulting from project actions. These monitoring measures should be as specific as possible, commensurate with the project's scope and the severity of its effects, and to the extent practicable and appropriate, establish target milestones and incorporate adaptive management options.

In conformance with these requirements, BLC proposes to monitor and to report implementation of the mitigation and minimization measures proposed by this HCP, and to monitor their effectiveness at improving the habitat of the riparian and channel environment that effect the species addressed by this HCP. Because BLC owns only a fraction of the area of the various watersheds in which it owns land, and borders only a fraction of stream length, BLC's monitoring measures focus on habitat conditions of the lands that it owns that can affect aquatic habitat, and the riparian area and streambanks that immediately border its lands.

Riparian areas typically revegetate rapidly once grazing and farming activities no longer prevent this revegetation (USDI 1998; Beschta 1997; Keller et al. 1978). Therefore the proposed approach to monitoring is based on the premise that riparian vegetative conditions would improve with implementation of the proposed conservation measures which control grazing and farming within riparian areas. Desired riparian functions of sediment and nutrient filtering, shade and water temperature control, large woody debris recruitment, bank stability and channel form would be provided by development of the riparian vegetative community.

Accordingly, BLC proposes to monitor the implementation of conservation practices and to verify the health or health improvement of the riparian areas addressed within this plan with low cost qualitative procedures that BLC believes to be commensurate with the project's scope and the severity of its effects proposed by the HCP. To this end, BLC proposes to depend heavily upon carefully located representative photo points to verify that riparian conditions meet the expectations described in the plan through the term of the plan: maintenance of good conditions and improvement of conditions where needed for the provision of riparian functions as they affect aquatic habitat elements of sediment, shade, nutrients and woody debris.

BLC does not believe that more elaborate monitoring approaches are necessary. Accordingly, BLC does not propose to monitor instream water column or habitat conditions, or to measure vegetative condition. BLC manages riparian conditions, expects these conditions will be maintained or improved as described, and fully expects that these conditions to be readily apparent and observable, and verifiable with the use of repeated photography. Here the reader is reminded that BLC plans no new uses of land; BLC only proposes improved uses of land intended to benefit the species addressed by the HCP.

There is one exception to the foregoing discussion of the need to monitor instream conditions or riparian vegetation. In Robinson Fork, BLC will be responsible for completing limited monitoring to assure that salmon and steelhead redds are not being impacted by the use of several fords which cross the creek, and that there is continued growth in the hardwood

vegetation within the riparian areas. The measures to achieve continued growth in riparian vegetation are described in previous sections of this agreement. Specific monitoring provisions to measure the effectiveness of these measures are as follows:

1. Each year, BLC managers will contact local representatives of the Washington Department of Fish and Wildlife to determine whether the Department plans its normal review of habitat conditions and fish usage in Robinson Fork. If so, then BLC will seek to coordinate the timing of the Department's work with the need to determine vegetative conditions and to look for potential impacts from the use of fords on spawning redds. If this can be achieved, then BLC will seek to complete this work cooperatively with the Department.
2. In the event the Department does not plan to conduct monitoring activities in Robinson Fork, or is unable to assist BLC in meeting its monitoring responsibilities, then the company will notify representatives of the FWS or NMFS to let them know of BLC's plans to conduct monitoring activities and seek those agencies' assistance in completing the required monitoring work at mutually agreeable times.
3. If neither the state nor federal agencies are able to assist in the required monitoring, then BLC will retain assistance from competent consultants to complete the monitoring and prepare a report with appropriate documentation of the results, which shall be forwarded to the appropriate state and federal agencies.

The primary monitoring measure proposed for many riparian areas is based on photo points. At each photo point, photos will be taken annually by BLC at approximately the same date, June 15 (+/- 14 days). These photos will then be systematically stored by BLC within the Annual Monitoring Summary Form, and each set of photos commented upon relative to the area's riparian area development goals. BLC will provide this monitoring information to the agencies annually; while monitoring progress meetings will occur one year after the signing of this plan and then every two years after that. Proposed HCP mitigation and minimization measures would be monitored as summarized in Table 11. Monitoring measures are also discussed for each management block and/or stream within Section 3.4.3 that details site specific and activity specific conservation practices that would be implemented to minimize and mitigate impacts of take.

Table 11. Summary of Monitoring Activities

Ownership Block	Management Action and/or Objective	Monitoring Objective	Measurement Frequency	Monitoring Measures and Reporting Procedure	Reporting Party
Pentecost	Continue to exclude cattle at all times from Field's Gulch by maintaining the effectiveness of the existing fence	Verify the condition of the fence and its ability to separate the cattle from the stream (this stream is dry in all but severe thunderstorms	Throughout the course of the year concurrent with normal management activities. Formally and thoroughly inspect twice per year, spring and fall.*	Documentation that verifies the fence's effectiveness to be provided to the federal agencies annually ¹⁶	BLC
Pataha Creek	Eliminate grazing on all BLC lands bordering Pataha Creek lying between the Creek and Highway 12 to allow development of a riparian area vegetated with brush, tree, and grass species capable of providing full riparian function	Verify that streambanks and riparian area become revegetated and stabilized	Once per year*	Forward NRCS reports that verify compliance with the CREP program land use requirements. Establish six photo points at GPS-documented locations distributed along the length of Pataha Creek where vegetation is currently in poor condition and/or soil is exposed. Provide photo verification and documentation annually	NRCS and BLC
Pataha Creek	Develop and maintain a well and upland water source south of Highway 12	Verify that the well is installed and that the water source remains functional	Once per year*	Document annually	NRCS and BLC
Pataha Creek	Maintain grassed waterways in dryland-farmed areas adjacent to ephemeral draws to prevent erosion of headwater channels	Multiple visual inspections annually. Compare FSA inventory to reinventories as FSA conducts them to verify that grassed waterways remain in place and control erosion effectively	Annual reporting of any erosion and/or treatment.* FSA inspections periodically at approximately 10-year intervals	Acreage comparison with field-by-field comparisons if needed. Annual reporting of any erosion and/or treatment.* Verify with GPS-located photo point photos of two representative waterways. Document annually	BLC

¹⁶ A reporting memorandum will be prepared that reports the observer's name, agency, date of observation, and condition relative to the monitoring objective.

Ownership Block	Management Action and/or Objective	Monitoring Objective	Measurement Frequency	Monitoring Measures and Reporting Procedure	Reporting Party
Tucannon River	Screen all pumps to newest bull trout, steelhead and chinook standards to prevent take of fry. Inspect screens annually at the beginning of each irrigation season	Verify installation of required screens. Verify that the screens have been inspected and maintained annually	Once per year	Document annually	BLC and WDFW
Tucannon River Block #1	Maintain existing riparian areas to prevent channel erosion, maintain shade, provide LWD recruitment, and filter sediment	Verify that existing riparian areas remain intact and richly vegetated	Annually in June*	Verify with two GPS-located photo point photos. Document annually	BLC
Tucannon River Block #2	Maintain existing fences and riparian areas to prevent channel erosion, maintain shade, provide LWD recruitment, and filter sediment	Verify that existing fences remain effective at excluding cattle from the riparian area. Verify that riparian areas remain intact and richly vegetated	Annually in June*	Verify with two GPS-located photo point photos. Document annually	BLC
Tucannon River Block #3	Maintain existing fences and riparian areas to prevent channel erosion, maintain shade, provide LWD recruitment, and filter sediment	Verify that existing fences remain effective at excluding cattle from the riparian area. Verify that riparian areas remain intact and richly vegetated	Annually in June*	Verify with two GPS-located photo point photos. Document annually	BLC

Ownership Block	Management Action and/or Objective	Monitoring Objective	Measurement Frequency	Monitoring Measures and Reporting Procedure	Reporting Party
Tucannon River Block #4	Maintain riparian areas to prevent channel erosion, maintain shade, provide LWD recruitment, and filter sediment. Eliminate grazing with fences per CREP contract. Build two new watering devices in the uplands away from fish-bearing streams	Verify that riparian areas remain intact and richly vegetated	Annually in June*	Forward NRCS reports that verify compliance with the CREP program land use requirements. Verify with two GPS-located photo point photos. Document annually	BLC
King/McGee	Maintain grassed waterways in dryland farmed areas adjacent to ephemeral draws	Multiple visual inspections annually. Verify that the waterways effectively prevent channel erosion. Document any unfavorable change	Annually in June. Annual reporting of any erosion and/or treatment*	Verify with GPS-located photo point photos of two representative waterways. Document annually	BLC
Beard	Maintain grassed waterways in dryland farmed areas adjacent to ephemeral draws	Multiple visual inspections annually. Verify that the waterways effectively prevent channel erosion. Document any unfavorable change	Annually in June. Annual reporting of any erosion and/or treatment*	Verify with GPS-located photo point photos of two representative waterways. Document annually	BLC
Romaine	Maintain grassed waterways in dryland farmed areas adjacent to ephemeral draws	Multiple visual inspections annually. Verify that the waterways effectively prevent channel erosion. Document any unfavorable change	Annually in June. Annual reporting of any erosion and/or treatment*	Verify with GPS-located photo point photos of two representative waterways. Results reported annually	BLC
Whetstone	Maintain grassed waterways in dryland farmed areas adjacent to ephemeral draws	Multiple visual inspections annually. Verify that the waterways effectively prevent channel erosion. Document any unfavorable change	Annually in June. Annual reporting of any erosion and/or treatment*	Verify with GPS-located photo point photos of two representative waterways. Document annually	BLC

Ownership Block	Management Action and/or Objective	Monitoring Objective	Measurement Frequency	Monitoring Measures and Reporting Procedure	Reporting Party
Patit Creek Block #1	<p>Move existing fences further from riparian areas to exclude cattle, develop wider riparian area on both sides of the stream, and allow development of a richly vegetated riparian area</p> <p>Add rock surfacing to BLC road along ephemeral tributary south of Patit in Sec. 20 to reduce prevent sediment delivery to Patit Creek</p>	<p>Verify fence relocation. Verify with photos that the riparian area continues to develop a rich vegetation community and that escarpments regrade and become vegetated</p> <p>Document any significant changes in road condition</p>	<p>Annually in June*</p> <p>As needed</p>	<p>Verify with two photo point locations representative of poor bank stability and/or poor vegetative condition with GPS location and bearing. Document annually</p>	<p>BLC</p> <p>BLC</p>
Patit Creek Block #2	Maintain and allow continued maturation of dense riparian vegetation	Verify with photos that the riparian area continues to develop a rich vegetation community	Annually in June*	Photo point two representative locations with GPS location and bearing and submit memorandum report with photos. Document annually	BLC
Patit Creek Block #3	<p>Fence 1,500 feet of Patit Creek to eliminate grazing from the riparian area and allow development of a richly vegetated riparian area</p> <p>Install a watering system away from the stream</p>	<p>Verify fence construction. Verify with photos development of the vegetative community. Photopoint two areas that were less than fully vegetated to measure improvement</p>	Annually in June*	Photo point two representative locations with GPS location and bearing and submit memorandum report with photos. Document annually	BLC
Patit Creek Block #4	Establish wider riparian area and revegetate bare soils therein	Allow development of well-vegetated riparian area and eliminate bare soil exposure and unstable banks near the stream and within the riparian area	Annually in June*	Verify the increased width of riparian area and development of riparian vegetation. Photo point two representative riparian areas treated to provide greater width with GPS location and bearing. Submit memorandum report with photos. Document annually	BLC

Ownership Block	Management Action and/or Objective	Monitoring Objective	Measurement Frequency	Monitoring Measures and Reporting Procedure	Reporting Party
Johnson Hollow	Maintain grassed waterways in dryland farmed areas adjacent to ephemeral draws	Multiple visual inspections annually. Verify that the waterways effectively prevent channel erosion. Document any unfavorable change.	Annually in June. Annual reporting of any erosion and/or treatment*	Memorandum report with GPS-located photo of two representative waterways. Document annually	BLC
Payne Hollow	Maintain existing fences and riparian vegetation	Maintain existing riparian areas and functions. These areas were heavily burned. Photopoints will document recovery	Annually in June*	Photo point two representative locations with GPS location and bearing and submit memorandum report with photo. Document annually	BLC
Robinson Fork	Develop and implement an approved road maintenance and abandonment plan for the watershed with emphasis on mitigating effects from the Bottom Road	This work has been completed	Annually in June to document changed conditions as a result of road modifications and CREP enrollment.*	Memorandum report with plans and progress reports attached. Document annually	BLC
Robinson Fork	Comply with all Forest Practices Rules	Submit all forest practices inspection and enforcement reports	Annually or as required	Submit BLC and WDNR reports to the federal agencies	BLC
Robinson Fork	Relocate, abandon, maintain, and improve forest roads in full compliance with the 2001 WDNR Road Maintenance and Abandonment Plan to reduce sediment delivery and improve riparian conditions and functions	Verify implementation of the Plan	Annually until Plan is fully implemented	Submit BLC and WDNR reports to the federal agencies within the annual monitoring report	BLC

Ownership Block	Management Action and/or Objective	Monitoring Objective	Measurement Frequency	Monitoring Measures and Reporting Procedure	Reporting Party
Robinson Fork	Maintain full riparian function by complying with the Forest Practices Rules.	Verify compliance including any harvest of trees within riparian management areas adjacent to the Robinson Fork	Continuously if and when harvest occurs within riparian areas	Submit BLC and WDNR reports annually to the federal agencies that include mapped location and basal area of any trees removed from regulated riparian areas adjacent to the Robinson Fork	BLC
	Eliminate grazing with fences per CREP contract	Verify that riparian areas remain intact and richly vegetated	Annually in June to document changes to riparian areas	Forward NRCS reports that verify compliance with CREP program land use requirements	

**Indicates practices where annual photos will be the primary monitoring tool.*

3.6.1 Adaptive Management

The BLC HCP encompasses long-standing land use practices in a semi-arid landscape. While there are stochastic events like fires or landslides or human induced influences on aquatic systems such as destructive grazing, long-term trends across the landscape are slow to develop and detect. The emphasis on established photopoints as a basis for BLC's monitoring plan is designed to help show the expected improvements in the growth and density of riparian vegetation over time, as well as to indicate the continued existence and effectiveness of the conservation measures contained in the HCP.

Monitoring will, over time, inevitably show changes across the landscape. It is equally inevitable that managers and scientists will acquire new knowledge about these landscapes and how best to manage them. Moreover, there will be normal changed circumstances and those that are unforeseeable. While we can predict change, we cannot, now, predict the impact of each change and how BLC should respond within the terms of this HCP. For that reason, the HCP process allows "adaptive management" as a way to address gaps in knowledge or the uncertainty of future events that would effect the species covered in the HCP.

BLC believes that incorporation of adaptive management concepts is vital to the overall success of the HCP. Implementing adaptive management will be a blend of analyzing the results of the annual monitoring requirements, addressing changed and unforeseen circumstances and taking advantage of new knowledge that might be useful to the implementation of the HCP. Examples of situations where adaptive management approaches might be useful include:

- Riparian vegetation appears to not respond to the conservation measures in the HCP,
- Combinations of salt and feeding supplements seem better at drawing cattle away from riparian areas than salt placement alone,
- Undesirable invasive plant species seem to be taking over in certain areas,
- New logging technologies or new markets for timber have implications for harvesting plans,
- New farming programs have implications for farm and livestock operations, or,
- There are unanticipated changes in the size and species composition of riparian vegetation.

All of the foregoing examples of changes might be best addressed cooperatively. BLC suggests that changes such as these be added to the agenda of the biennial progress meetings described in the following section. Through these discussions, BLC's managers and the agency representatives can assess new situations and develop adaptive management strategies to properly address them.

Section 10 regulations (50 CFR 17.22 (b)(2)(iii)) require that an HCP specify the procedures to be used for dealing with "changed" and "unforeseen" circumstances that may arise during the term of the HCP. In addition, the "no surprises" policy limits the obligations of landowners in meeting these new situations. This section outlines how changing situations will be addressed for the BLC lands and how the "no surprises" policy would be implemented.

BLC and the agencies have made every effort to anticipate the minimization, monitoring, and mitigation measures necessary to conserve the species covered by the HCP and the habitat conditions within BLC's control. However, BLC and the public agencies that are parties to this HCP recognize that on-the-ground situations can change, either through natural forces or through the actions of humans. Some of these changes are predictable, such as a wildfire that burns at a level of intensity and is of a size that is historically common for the area. Other changes are not as predictable, like the discovery of a precious mineral within the HCP area or a major change in the economics of farming.

As described in the "Habitat Conservation Planning Handbook" (pg. 3-28), "unforeseen circumstances" or "extraordinary circumstances" are broadly defined to include a variety of changing situations that may occur over the life of the HCP, but which were not or could not be anticipated by the Services or the HCP applicant at the time the HCP was being developed but which may result in substantial or adverse changes to the status of a covered species. On the other hand, "changed circumstances" are not uncommon during the course of an ongoing HCP and can reasonably be anticipated and planned for. Section 10 of the Endangered Species Act and the regulations from it require that the HCP include provisions for addressing both predictable, "changed" circumstances and "unforeseen" circumstances, either of which may threaten or cause a substantial dynamics in the population of any covered species or in the overall quality of any habitat of that species as described in this plan.

3.6.2 Differentiating Between "Changed" and "Unforeseen" Circumstances

"Changed" circumstances include those relatively predictable events for the landscapes included in the BLC HCP. These include, for example, a wildfire that burns perhaps 500 acres, an event that is a hallmark of the timber and rangelands within the BLC ownership. For the purposes of this HCP, such "changed" circumstances include (but are not limited to):

- Listing of a new species not covered by this HCP.
- Vandalism or other intentional, destructive, illegal human activities.
- Natural catastrophic events such as fire, drought, severe wind or water erosion, floods, and landslides (also landslides associated with earthquakes) of a magnitude expected to occur during the term of the permit. The magnitude of natural catastrophic events should be evaluated on the basis of historical records of the frequency and magnitude of such events. Events with a magnitude likely to occur during an average 30-year period would be considered changed circumstances. Events expected to occur less frequently than once during an average 30-year period would be unforeseen circumstances.

- Invasion by exotic species, habitat or species-specific disease, or any other circumstance that significantly threatens covered species or their habitats and that affects populations of covered species throughout a substantial portion of their distribution in the HCP area.
- Initiation of grazing, farming or logging in a portion of BLC's ownership where those activities did not commonly take place when the HCP was being prepared,
- Land purchases, sales or exchanges, and
- New scientific knowledge, which, if applied, could further the purposes of this HCP.

Table 12 summarizes "changed circumstances" and BLC's likely responses to them. Changed circumstances and responses would require consultation with Services and documentation.

Table 12. Predictable Changed Circumstances and Likely Responses		
<u>Changed Situation</u>	<u>As Evidenced By.....</u>	<u>Likely Response</u>
Commodity prices favor grazing	Farm land converted to pasture	BLC would manage "new" grazing land according to the general grazing standards in the HCP, ie: implement riparian buffers equivalent to CREP on fish-bearing streams; provide upland watering sites, keep salt away from streams and wetlands, minimize sediments and nutrients into streams
Relatively small, lethal fire	Substantial timber mortality on perhaps 500 acres or less	BLC would salvage dead timber according to FPA rules and stabilize all sediment sources. BLC may replant area or may graze it. Measures would be implemented to protect or improve riparian areas
CREP, CRP contracts not renewed	Formal notification from agencies	CREP lands would likely be maintained in the condition existing at that time and BLC would consult with the Services over any modifications. BLC would maintain CRP areas in accordance with HCP standards
Riparian vegetation not meeting expectations	Poor growth or failed plantings	BLC would consult with appropriate agencies to determine cause and develop site specific responses that may include grazing exclosures or additional plantings
There is a need to add covered species	Additional T&E listings or the likelihood thereof	BLC would consult with appropriate agencies to determine the nature and extent of changes needed to the HCP to cover the additional species
New economic opportunities	The need for additional roads or ground disturbing activities	Any new roads or ground disturbing activities in excess of one-half acre, regardless of their purpose, would be constructed or maintained to the standards set forth in either the Forest Practice Act rules or local planning and zoning requirements
Additional areas for timber harvest	Newly acquired land or maturing trees that were planted previously	All forest management activities would be conducted according to the relevant FPA rules, but in no case shall these practices be carried out in a manner that is less stringent than the FPA rules in place at the time this HCP is approved
Additional areas for grazing or farming	Land acquisitions or changes in land use	Newly acquired lands or lands where the use is changed would be managed to the HCP's standards applicable for that land use
Excessive cattle use of riparian areas	Poor riparian growth, sedimentation or the failure of current herding practices to prevent riparian use	BLC would take immediate steps to reduce cattle use including the herding, salting or upland water developments set forth in the HCP. Fencing may be required in extreme cases
Floods damage riparian areas	Scoured streams, debris avalanches, debris dams, channel changes	BLC would consult with appropriate agencies to develop site specific responses, including active restoration and exclosures from grazing
Above normal timber harvests	The need to salvage dead timber or high timber values	All forest management activities would be conducted according to the relevant FPA rules, but in no case shall these practices be carried out in a manner that is less stringent than the FPA rules in place at the time this HCP is approved

“Unforeseen” circumstances are those that are completely unpredictable (an earthquake or volcanic eruption or the outbreak of a disease completely lethal to one or more wildlife species) or a more normal situation that exceeds historic variability and which results in a substantial and adverse change to the status of a covered species. A wildfire of perhaps 2,000 acres might be such an “unforeseen” event, since fires of this magnitude have seldom occurred over the BLC ownership. For the purposes of this HCP, “unforeseen” circumstances would include (but not be limited to):

- Natural catastrophic events such as fire, drought, severe wind or water erosion, floods, and landslides (also landslides associated with earthquakes) of a magnitude exceeding that expected to occur during the term of the permit
- Invasion by exotic species not currently found on BLC’s lands or within the general area or habitat type or species-specific disease that threaten covered species

Since, by definition, “unforeseen” circumstances cannot be predicted, it is impossible to identify all of them before they occur. Therefore, it is necessary to define them after the fact, and, for that reason, this HCP includes a process for making that determination. In making the determination of what constitutes an “unforeseen” event, the Fish and Wildlife Service, in cooperation with other relevant agencies or interests shall consider such factors as:

- Percentage of the range adversely affected by the HCP;
- Percentage of the range conserved by the HCP;
- Ecological significance of that portion of the range affected by the HCP;
- The level of knowledge about the affected species and the degree of specificity of the species’ conservation program under the HCP and whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild.

Prior to making a determination regarding the occurrence of any unforeseen circumstance, the Services and BLC shall comply with the following procedures.

(1) Notice to applicants and participants

Either BLC or the Services shall inform the other and all other relevant parties to this agreement upon the discovery of a possible “unforeseen circumstance”. This notification shall include a detailed statement of the facts regarding the unforeseen circumstance involved and the anticipated impact on the covered species and its habitat, and any other information and data relevant to the situation. In addition, the notice shall include any proposed conservation measure(s) that the agencies or BLC believe would address the unforeseen circumstance, an estimate of the cost of implementing such conservation measure(s).

(2) Response

BLC, in consultation with the USFWS, may choose to perform an expedited analysis of the covered species or its habitat affected by the alleged unforeseen circumstance and to modify or

redirect existing conservation measures to mitigate the effects of the unforeseen circumstance, within the scope of existing funded conservation actions. To the extent that these modified or redirected conservation measures do not affect conservation of other species, habitats, or key areas, this may be deemed an adequate response to the unforeseen circumstance. If the proposed modifications or redirected conservation actions could affect the conservation of other covered species or its habitat, the procedure outlined below will be followed.

(3) Submission of information by others

BLC shall have a meaningful opportunity to submit information to the agencies within 60 days of the written notice. Upon the written request of BLC, the time for submission of said information may be extended by the agencies. Such a request would not be unreasonably denied.

(4) Findings

The agencies shall have the burden of demonstrating that an unforeseen circumstance has occurred and that such unforeseen circumstance is having or is likely to have a significant adverse impact on the covered species or its habitat. The findings of the agencies must be clearly documented and be based upon the best scientific and commercial data available regarding the status and habitat requirements of the species. In addition, based on the results of an expedited analysis of the changed or unforeseen circumstance and the information provided by BLC, the agencies shall provide the justification and approval for any reallocation of funds or resources necessary to respond to the unforeseen circumstance within the existing commitments of BLC under the HCP.

3.6.3 Response to Changed Circumstances

It is quite likely that additional and/or different conservation measures not contained in the HCP would be suggested and be proven to be effective during the term of the HCP. It may also be possible that measures currently included in the original HCP may prove to be less effective than originally thought as a means to conserve either the species or their habitats. Therefore, BLC, with the cooperation of USFWS and NMFS, will utilize monitoring and “adaptive management” to gauge the effectiveness of existing conservation measures and to propose additional or alternative conservation measures as the need arises to deal with changed circumstances, in a manner consistent with the examples in Table 12.

The new listing of a species not covered by this HCP may constitute a changed circumstance and deserves special mention. The agencies shall immediately notify BLC upon becoming aware that a species which is associated with the habitats found within the BLC HCP area and which is not a covered species in the HCP may be listed or proposed for listing. Upon receipt of notice of the potential listing of an uncovered species, BLC may, but is not required to, enter into negotiations with the agencies regarding necessary modifications, if any, to the HCP required to amend the applicable federal permit to cover the uncovered species. If BLC elects to pursue amendment of the permit, the agencies would provide technical assistance in identifying any modifications to the HCP that may be necessary to amend the applicable federal permit to authorize incidental take of such uncovered species. In doing so, the agencies shall take into

account the conservation and mitigation measures already provided in the HCP and cooperate with BLC to minimize any adverse effects of the listing of such uncovered species on the covered activities consistent with Section 10 of ESA.

3.6.4 Response to Unforeseen Circumstances

If, after the conclusion of the process outlined above, the agencies determine that an unforeseen circumstance has occurred, they may identify additional conservation measures to address such circumstance and which were not contemplated in the original HCP. BLC and the Services will discuss the extent to which those measures could be achieved by modification or redirection of the existing funded conservation measures. Any proposed additional conservation measures shall fit, to the maximum extent possible, within the terms of the HCP. Provided that BLC has fully complied with the terms of the HCP, the “no surprises” policy shall apply and the agencies would not require the commitment of additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources, even upon a finding of unforeseen circumstances, unless BLC consents.

If additional expenditures are required, the agencies may elect to take the additional actions that could lead to the conservation or enhancement of a species that is being adversely affected by an unforeseen circumstance. The costs of these additional actions shall be borne by the relevant federal agency and may include the purchase or exchange of land in other areas to offset the loss of any habitat from within the area of this HCP. However, the agencies agree that prior to undertaking or attempting to impose any action or conservation measure, they shall consider all practical alternatives to the proposed conservation measure.

3.6.5 “No Surprises” Policy

As used in this section, the terms “changed circumstances” and “unforeseen circumstances” are intended to have the same meaning as defined in the Habitat Conservation Plan Assurances (“no surprises”) policy. This policy applies so long as BLC has complied fully with all the terms of the HCP and its provisions are being implemented. Consistent with the USFWS and NMFS Habitat Conservation Consultation Handbook (1988), this No Surprises policy provides that except as otherwise required by law, no further mitigation for the effects of the proposed HCP upon the Covered Species may be required from a Permittee (BLC) who has otherwise abided by the terms of the HCP, except in the event of unforeseen circumstances; provided that any such additional mitigation may not require additional land or water use restrictions or financial compensation from the Permittee without his/her written consent.

3.6.6 Review of BLC’s Compliance with Section 10 Requirements

As noted in Section 3.2, Section 10 of the Endangered Species Act includes very specific requirement that each HCP developed under that section must meet in order for it to be approved. Following is a restatement of those requirements, along with a summary of BLC’s efforts to comply with them.

1. *The impact that would likely result from the “taking” allowable under the HCP*
BLC’s land ownership is one of many along many miles of stream habitat. Other ownerships and other land uses, even those in the immediate vicinity of BLC’s lands, exhibit management practices that, at best, are on par with BLC’s. Given the small percentage of habitat that BLC can influence or protect through this HCP, it is highly unlikely that any taking as a result of the company’s enterprises would ever be significant.

2. *The taking would not appreciably reduce the likelihood of the survival and recovery of the species*

As noted in the previous paragraph, the limited contribution of BLC’s management practices, whether positive or negative, is not likely to effect the broader aquatic systems that constitute the native habitat for the listed species.

3. *The taking must be incidental to otherwise lawful activities*

The land uses associated with BLC’s ownership are well established as both within the bounds of existing law and within the culture of the area. BLC plans to continue those operations, as set forth in this HCP and the conservation practices in it. Any taking of the listed species would be incidental to those operations.

4. *The applicant must consider alternatives to the taking authorized in the HCP and note the reasons these alternative actions were not being utilized*

BLC’s alternative to the practices outlined in this HCP was to continue to operate without the HCP, as does virtually every other farm and ranch along the streams and rivers that flow through BLC’s lands. Theoretically, such an action would have resulted in a level of take that would be greater than if the conservation actions in the HCP are applied. Thus, BLC has chosen to both mitigate any impacts that its operations might have on the listed species and reduce the theoretical level of take that might otherwise occur. It could be argued that any take could be eliminated by major changes in BLC’s operation, and such actions were analyzed in the EA portion of this document. Put simply, those alternatives would have foreclosed the opportunities for the company to economically manage its lands and are, therefore, unacceptable.

5. *The applicant must assure adequate funding for the plan*

BLC has been a business entity since approximately 1902. The combination of BLC’s stability within the agricultural community and the availability of federal and state cost-share funds for some of the more expensive conservation practices should be ample evidence of adequate and continuing financial resources to implement the plan. In reality, much of the implementation work is either accomplished or in progress. To help offset any potential shortfall of funds, BLC will commit to dedicating a portion of CREP and CRP rental payments to the implementation of this agreement.

6. *The applicant must mitigate and minimize the impacts to listed species to the maximum extent practicable*

The management actions set forth in this HCP are designed to achieve a balance between all that is possible to protect riparian and aquatic habitats and those economic activities that allow BLC to remain in business. Whether these actions are judged to be “to the maximum extent practicable” is subjective. It was, for example, possible for BLC to exclude all grazing in

Robinson Fork, an even stronger mitigative action before the 2006 fire. However, summer grazing in that watershed was key to the company's livestock operation and the management for Robinson Fork as proposed in this HCP would have allowed that to continue while, at the same time, minimizing (but not eliminating) the impacts to fish. However, that is now a moot point, and the result of the fire is that there will be temporary increases in sediment and probably water temperature, but grazing will now be eliminated in Robinson Fork and, over the long term, these impacts will be greatly reduced. It is the view of BLC that the management actions in the HCP are both practical for the company and would cause minimal impacts to the fish species covered in it. Table 13 summarizes the change in the potential level of "take" of listed species under current management practices and that which is projected after the conservation practices outlined in this plan are implemented.

7. *The Secretary may require other measures necessary and appropriate for the purposes of the plan*

This HCP was developed in cooperation with the U.S. Fish and Wildlife Service, NOAA Fisheries and the Washington Department of Fish and Wildlife. Representatives of these agencies suggested management and mitigation actions, which remain the basis for the actions set forth in the HCP.

Table 13. Possible Effects of BLC Activities on Covered Species

Covered Activities	Potential Level of Effect							
	Current Activities				Activities With HCP Conservation Measures			
	No Effect	Not Likely to Effect	May Effect	Take	No Effect	Not Likely to Effect	May Effect	Take
Forest Management								
Timber Harvest			x			x		
Hauling on Roads			x			x		
Use of Robinson Fork fords			x	x			x	x still risk of take but minimized
Helicopter Use			x			x		
Road Construction			x			x		
Road Maintenance			x			x		
Road Decommissioning			x			x		
Site Preparation		x			x			
Tree Planting		x			x			
Thinning			x			x		
Wildfire Management		x				x		
Stream Enhancement		x				x		
Grazing								
Pasture Management			x			x		
Herd Dispersion			x	x			x	x still fords on Tucannon; but minimized

Covered Activities	Potential Level of Effect							
	Current Activities				Activities With HCP Conservation Measures			
	No Effect	Not Likely to Effect	May Effect	Take	No Effect	Not Likely to Effect	May Effect	Take
Winter Feeding		x				x		
Salt/nutrient Placement		x				x		
Fencing and Water		x				x		
Corrals and Loading		x				x		
Veterinary Facilities		x				x		
Temporary Housing		x				x		
Animal Waste Mgmt.		x				x		
Animal Disposal		x				x		
Farming								
Plowing and Tillage			x	x still within SPTH of stream			x	x – buffered, but still within SPTH of stream
Planting			x				x	
Fertilization			x			x		
Manure Application		x				x		
Harvest and Mowing			x			x		
Vegetation & Weed Control			x			x		
Fencing			x			x		
Road Management			x			x		
Use of Existing Fords		x	x	x		x	x	x – still possible take but mini-mized

Covered Activities	Potential Level of Effect							
	Current Activities				Activities With HCP Conservation Measures			
	No Effect	Not Likely to Effect	May Effect	Take	No Effect	Not Likely to Effect	May Effect	Take
Pumping and Water Storage		x	x				x	x – still using water in Tucan-non in low flow seasons
Irrigation		x	x			x	x	x
Ditch Management		x				x		
Fallow Management		x				x		

Chapter 4 Implementation of the HCP

4.1 Implementation of the BLC HCP and the Amendment Process

4.1.1 Clarifications, Amendments, Administrative Amendments

Experience has shown that from time to time it may be necessary for the agencies and BLC to clarify provisions of the HCP or the permit (collectively known as the plan documents) to deal with issues that arise with respect to the administration of the process or to be more specific regarding the precise meaning and intent of the language contained within those documents. Clarifications do not change the provisions of any of the documents in any way, but merely clarify and make more precise the provisions as they exist.

Except for minor amendments and clarifications, neither the HCP nor the permit may be amended or modified in any way without the written approval of the BLC and all other signatories, including the federal and state agencies. All proposed material changes or amendments shall be reviewed by the signatories of the plan documents and shall be processed as an amendment to the permit in accordance with the provisions of the ESA and appropriate environmental review under the provisions of NEPA.

4.1.2 Progress Report

BLC will provide annual monitoring reports to FWS and NMFS. The report shall include monitoring results, implementation progress, and documentation of any changed circumstances and approaches implemented to address the changed circumstances, and any other information necessary or helpful to document progress on the HCP and effects to covered species. BLC and the relevant federal and state agencies shall meet approximately 1 year from date of permit issuance, then at least once every 2 years to review progress in implementing the HCP. This meeting shall be at a time and place mutually agreeable to all parties involved and shall be initiated by the U.S. Fish and Wildlife Service. This meeting shall also serve as a forum to discuss monitoring results and the need for any adaptive management actions needed as part of the obligations of the parties to the plan.

4.1.3 Terms and Conditions

This conservation plan is subject to all the terms and conditions laid out in the Agreement. It is also subject to the following additional terms and conditions:

- A. Modifications of the Site-Specific Plan.** Any party may propose modifications to this plan by providing written notice to the other parties. Such notice shall include a statement of the proposed modification and the reason for the modification. The parties will use their best efforts to respond to proposed modifications within 60 days of receipt of such notice. Proposed modifications will become effective upon the other parties' written approval.

B. Termination of the Plan. BLC may terminate implementation of the site-specific plan's voluntary management actions prior to the plan's expiration date, for good cause, even if the expected benefits have not been realized. If BLC is unable to continue implementation of the site-specific plan or other stipulations of the Agreement, whether due to catastrophic destruction of the species population numbers or habitat or due to unforeseen hardship, the company would relinquish all Section 10 permits issued pursuant to this agreement. The landowner may terminate this site-specific plan for good cause with 30 days prior written notice to the other Parties. The company also may terminate the site-specific plan at any time for any other reason, but termination for reasons other than uncontrollable circumstances such as those associated with a force majeure event shall extinguish the Permittee's authority to take species (if listed) under the permit.

C. Transfer and Acquisition of Property. Nothing in this plan or the permits limit BLC's right to acquire or sell land. Any lands that might be acquired will not be covered by the plan or permits issued pursuant to it except upon amendment of the plan and permit as provided in this section. In the event that BLC sells land covered in this plan and permits issued pursuant to it, the agencies shall have sole discretion in deciding whether to transfer the permits to the new owner, provided that owner shall have made application in writing for such transfer and shall agree to abide by the existing terms of the plan and the permits.

D. Remedies. Each party shall have all remedies otherwise available to enforce the terms of this plan, except that no party shall be liable in damages for any breach of this site-specific plan, any performance or failure to perform an obligation under this plan, or any other cause of action arising from this plan.

F. Dispute Resolution. The parties agree to work together in good faith to resolve any disputes.

G. Availability of Funds. Implementation of this plan is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this plan will be construed by the parties to require the obligation, appropriation, or expenditure of any money from the U.S. Treasury. The parties acknowledge that the Services will not be required under this plan to expend any federal agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to commit to such expenditures as evidenced in writing.

H. No Third-party Beneficiaries. This site-specific plan does not create any new right or interest in any member of the public as a third-party beneficiary, nor shall it authorize anyone not a party to this plan to maintain a suit for personal injuries or damages pursuant to the provisions of this site-specific plan. The duties, obligations, and responsibilities of the parties to this site-specific plan with respect to third parties shall remain as imposed under existing law.

I. Relationship to Authorities. The terms of this plan shall be governed by and construed in accordance with applicable federal law. Nothing in this plan is intended to limit the authority of the Service to fulfill its responsibilities under federal laws. All activities undertaken pursuant to this plan or the permit must be in compliance with all applicable state and federal laws and regulations.

J. Succession and Transfer. This site-specific plan shall be binding on and shall inure to the benefit of the parties and their respective successors and transferees, in accordance with applicable federal regulations (currently codified at 50 CFR 13.24 and 13.25).

K. Notices and Reports. Any notices or reports required by this Agreement shall be delivered in writing to: Supervisor, Upper Columbia Fish and Wildlife Office, 11103 E. Montgomery Drive, Spokane, WA 99224 and Supervisor, National Marine Fisheries Service, 510 Desmond Dr, SE, Suite 103, Lacey, WA 98503.

Chapter 5 Description of Alternatives

5.1 Description of Alternatives

The NEPA requires that a range of reasonable alternatives to the proposed action be described. Three alternatives were identified by the Services as comprising a range of reasonable alternatives, including the No-Action Alternative. A summary of the components of each alternative is provided in Table 14.

5.1.1 The No-Action Alternative

Under the No-Action Alternative, the HCP would not be implemented, and the Services would not issue an ITP for the listed species. BLC's forest management practices would be subject to the Forest Practices Rules, which would include incidental take coverage for steelhead and bull trout under the State Forest and Fish HCP only for the forestry activities (See subsection 2.5, Relationship to Other Plans, Policies, and Laws). The Forest Practices Rules do provide some protections for riparian zones, and limits roads and harvest. BLC would continue to conduct its operations without ITP coverage for farming and grazing activities. This alternative would not provide BLC an incidental take permit, thus would not give BLC regulatory certainty. However, BLC's current land management practices and compliance with existing regulations (such as Washington State's Forest Practices Rules) would likely result in either slow improvements or maintenance of the current riparian and stream conditions.

5.1.2 Farm and Rangeland HCP Alternative

Under this alternative, the HCP would include only BLC's non-forested farming and grazing lands and their agricultural operations. All the management practices pertaining to grazing or farming presented under the Proposed Action Alternative would apply to the non-forested lands. The BLC would implement conservation measures that would reduce or eliminate livestock access to the riparian and stream areas on agricultural and grazing land, and minimize sediments into the streams. The Services would issue an ITP for listed fish species (Chinook salmon, steelhead, and bull trout) in those areas. This alternative would give BLC regulatory certainty for agriculture and grazing activities outside of its forest lands. BLC could plan and implement its agricultural activities with regulatory certainty. Management on BLC forested lands would be the same as management under the No-Action Alternative.

5.1.3 Proposed Action Alternative

As the proposed action, BLC's HCP is fully described in chapters 3 and 4, plus appendices. The BLC HCP would be implemented to cover all BLC farming, forest management, and grazing activities within the project area. BLC would implement conservation measures that would reduce or eliminate livestock access to the riparian and stream areas, decrease sediments, and ensure ongoing conservation measures for the life of the HCP. The Services would issue an ITP for Chinook salmon, steelhead, and bull trout. This alternative would give BLC regulatory certainty for planning and management of agricultural and forest harvest activities.

5.2 Alternatives Considered but Not Analyzed in Detail

Two alternatives were considered but rejected in the development of this EA/HCP.

- **Wide Buffer HCP** - This alternative would include all of BLC's farming, forest management, and grazing activities, with "no touch" riparian buffers of 100 feet along intermittent streams and ephemeral draws and 200 feet along all perennial streams. In most instances this would require fencing of the streams to exclude livestock. The Services would issue an ITP for Chinook salmon, steelhead, and bull trout.

This alternative does not meet the purpose and need because it would prevent BLC from managing and using significant tracts of land for the financial benefit of the owners and as a component of the local economy, and it would impose a significant financial burden from the cost of installation and maintenance of the necessary fences.

- **No Impact HCP**- BLC's managers could reduce their land management activities to the point where potential incidental take of the listed aquatic species would be eliminated. BLC would so restrict its logging, farming, or grazing activities that no impact from them to the aquatic or riparian habitats could reasonably be expected to occur. This would be accomplished either by large reductions in activities (for example, logging only to remove individual dead or dying trees), or by managing BLC's lands in a custodial manner. This might involve restricting grazing or farming to only those areas with no running water or where there is no possibility of sediment delivery to watercourses. This alternative does not meet the purpose and need because it would prevent BLC from managing certain tracts of lands for the financial benefit of the owners and as a component of the local economy.

Table 14. Summary of the Components of Each of the Alternatives Considered

Alternative	Acres Covered	Management Direction
No Action	None	BLC would continue to manage its lands in accordance with applicable laws and current agricultural and economic practices. BLC would follow Forest Practices Rules, and continue CRP and CREP as long as funding continues.
Farm and Rangeland Alternative	33,290	The fencing, herd management, and water developments described for the Proposed Action Alternative would continue as planned on non-forested lands. BLC would undertake the general and site-specific measures to alleviate stressors that are relevant to the farm and livestock operations. BLC would maintain CREP buffers in a riparian buffer condition for life of HCP (Except in Robinson Fork where buffer maintained for life of CREP contract only). Forest activities managed as in No-Action Alternative
Proposed Action Alternative - HCP coverage for entire BLC ownership	38,452	BLC would undertake all general, site-specific and activity-specific measures to alleviate stressors on farm, grazing and forest lands. BLC would follow Forest Practices Rules, or better. BLC would maintain CREP buffer on forest lands for life of contract, then monitor and manage grazing to ensure maintenance of riparian vegetation. Other CREP buffers maintained for life of HCP

Chapter 6 Affected Environment

6.1 Affected Environment

6.1.1 Setting

Columbia County is located in southeast Washington. The county is drained by the Tucannon and Touchet Rivers, which originate in forested areas of the Blue Mountains that lie in the southern part of the county. Topography of the county is characterized by long, gentle to moderately steep slopes intersected by steep canyons. Elevations range from 540 feet at the Tucannon River confluence with the Snake River to 6,400 feet at the head of the Tucannon in the Blue Mountains at Oregon Butte. The mouth of the Tucannon River is inundated by the reservoir formed by Lower Monumental Dam, located 20 miles downstream on the Snake River. The Touchet River originates as four major branches in the Blue Mountains upstream of Dayton, Washington, and joins the Walla Walla River approximately 25 miles downstream of Dayton.

Minor ephemeral streams also drain directly to the Snake River. Thorough descriptions of the county, its land uses, and land use effects on streams and stream conditions are provided by the Tucannon River Model Watershed Plan (Columbia Conservation District 1997), the Pataha Creek Model Watershed Plan (Pomeroy Conservation District 1997), and the Touchet River Watershed Characterization (Saul et al 1999). Much of the information recounted for this section of the HCP is excerpted from those documents.

Precipitation generally dictates land uses in the area. Climate of the county is continental moderated by marine Pacific air masses, and is heavily influenced by its wide range of elevations. Mean annual precipitation is as low as 8-inches at the lowest elevations near the Snake River and exceeds 40-inches at the highest elevations in the Blue Mountains. Measured temperatures have ranged from -22° F to 114° F, with temperatures decreasing with increasing elevation. Precipitation is well distributed throughout the year, with the exception of July and August, which are comparatively dry and hot (Harrison et al 1973).

Columbia County is predominantly agricultural, with approximately one-third of the county in dry crops (winter wheat, barley, peas, and bluegrass seed), followed by grazed range and forestlands. Irrigated pasture and croplands occur in the bottomlands adjacent to major streams, but acreage is limited to less than 1 percent of the county. Dry crops are grown with cultivation on slopes of up to 45 percent gradient, with most areas classified as highly erodible (Harrison et al 1973). Grazed lands occupy areas that are either too steep or too dry to farm. Forestlands occupy the steeper and stonier slopes with 25 or more inches of precipitation in the Blue Mountains. Most forestlands are used for livestock grazing in the summer.

Both the culture and the economy of this part of Columbia County and its towns is a function of agriculture. The county seat, Dayton, population approximately 2,600, and Starbuck, population less than 300, are the major towns in the county. Farmland dominates the landscape, broken up by occasional wooded canyons and small to mid-sized streams (such as Robinson Fork) or rivers. The agriculturally-oriented culture of the area is enriched by the Umatilla Reservation and the reservation lands and enterprises that are centered around the Tribal headquarters on the Umatilla

River, 7 miles east of Pendleton, Oregon. Most of the land in the county is in private ownership, with small parcels of state land scattered throughout the county. Federal land comprises part of the Umatilla National Forest, in the higher elevations in the southern part of the county. Figure 12 shows the land ownership patterns of the county.

The towns of Dayton and Starbuck are both near parcels of BLC land (Figure 12). There are no major dams or parks in the vicinity of Broughton lands.

The BLC's ownership of over 38,000 acres (59 square miles) comprises less than 7 percent of the 900 square mile area of Columbia County. BLC is one of over 300 owners of farm, grazing, and forestlands in the county. The BLC's ownership is divided into 11 parcels of approximately 1,000 to 7,000 acres each (Figures 12 and 13).

The disjunct parcels range from low elevation, low rainfall regions in the north near the Snake River to the higher elevation, wetter Robinson Fork parcel in the forests of the Blue Mountains to the south. BLC's land uses are generally dictated by the levels of precipitation and follow the general pattern of land use in the county. Grazing is the predominant use in the north, timber harvest and grazing in the forests on the mountain slopes to the south, and dryland crop agriculture predominates in the moderate precipitation areas in between.

The parcels of BLC's land are concentrated in specific areas and stream drainages. The management of those parcels can affect fish, fish habitat, and riparian vegetation at the sites and at areas downstream (Figure 12). For purposes of understanding the condition and effect of BLC lands on fish habitat within Columbia County, the discussion of BLC's land is grouped both by river and stream systems, and by ownership blocks. Figures 12 and 13 and Appendix 1, the photo-documentary, further illustrates the relationship of BLC's lands and land management to the stream systems that they border.

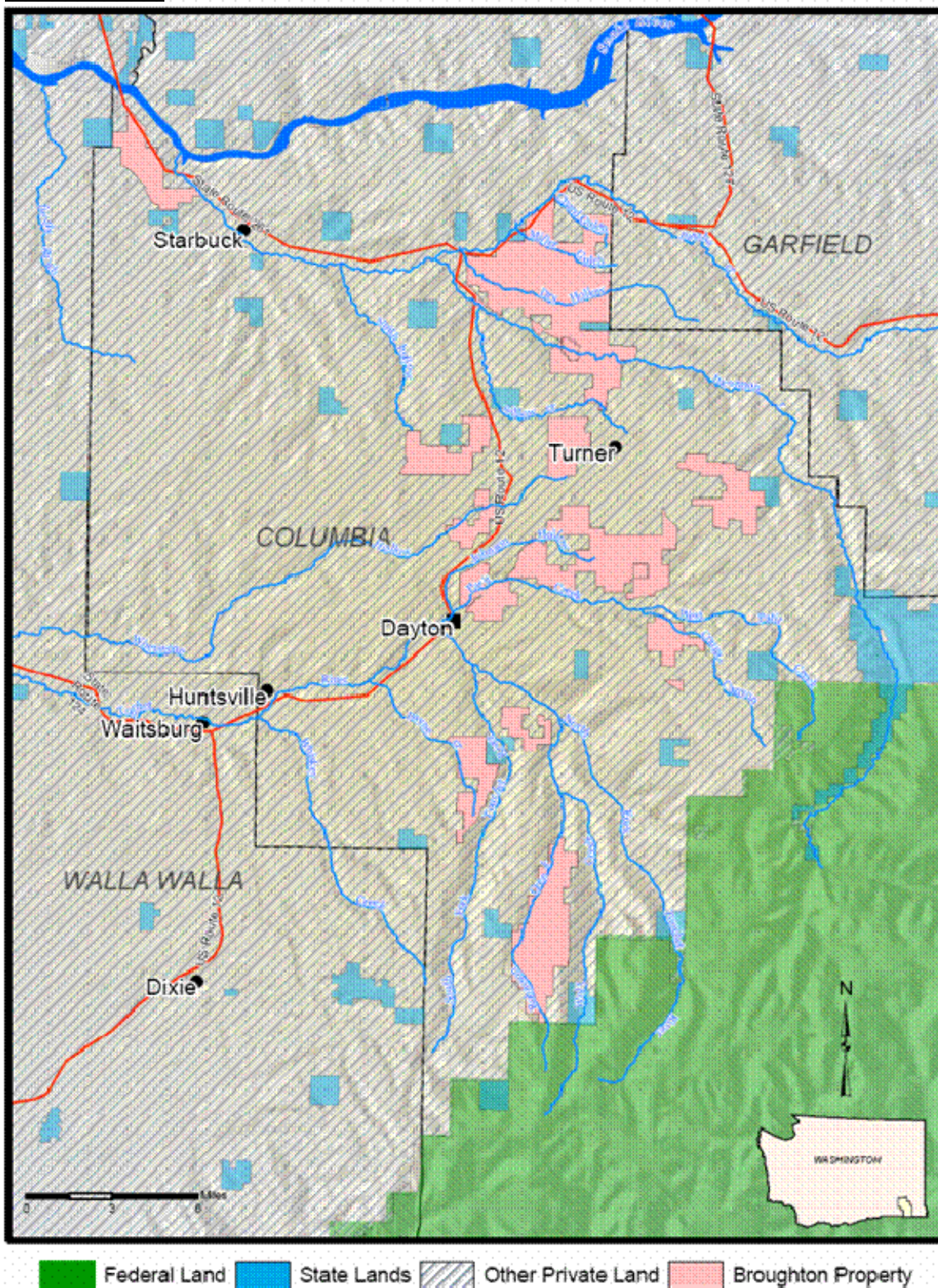
6.1.2 The BLC Ownership and the HCP Area

As shown in Figures 12 and 13, BLC's lands are grouped into several contiguous blocks of ownership of approximately 1,000 to 7,000 acres each. For purposes of understanding the condition and effect of BLC lands on fish habitat in Columbia County, we have grouped our discussion of BLC's land by these ownership blocks. Appendix 1, the photodocumentary, further illustrates the relationship of BLC's lands and land management to the stream systems that they border.

The Broughton enterprises follow the general pattern of land use in the county. Precipitation generally dictates land uses in the area. Annual precipitation is around 10-inches at the low elevations in the northern part of the county, and rises gradually with increasing elevation to over 50-inches to the south in the Blue Mountains. Grazing is the predominant use in the north, forests occupy the mountain slopes to the south, and dryland crop agriculture predominates in the moderate precipitation areas in between.

Figure 12.

Land Ownership in Columbia County, Washington



No warranty is made by the U.S. Fish and Wildlife Service as to accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.

Figure 13. BLC's Ownership

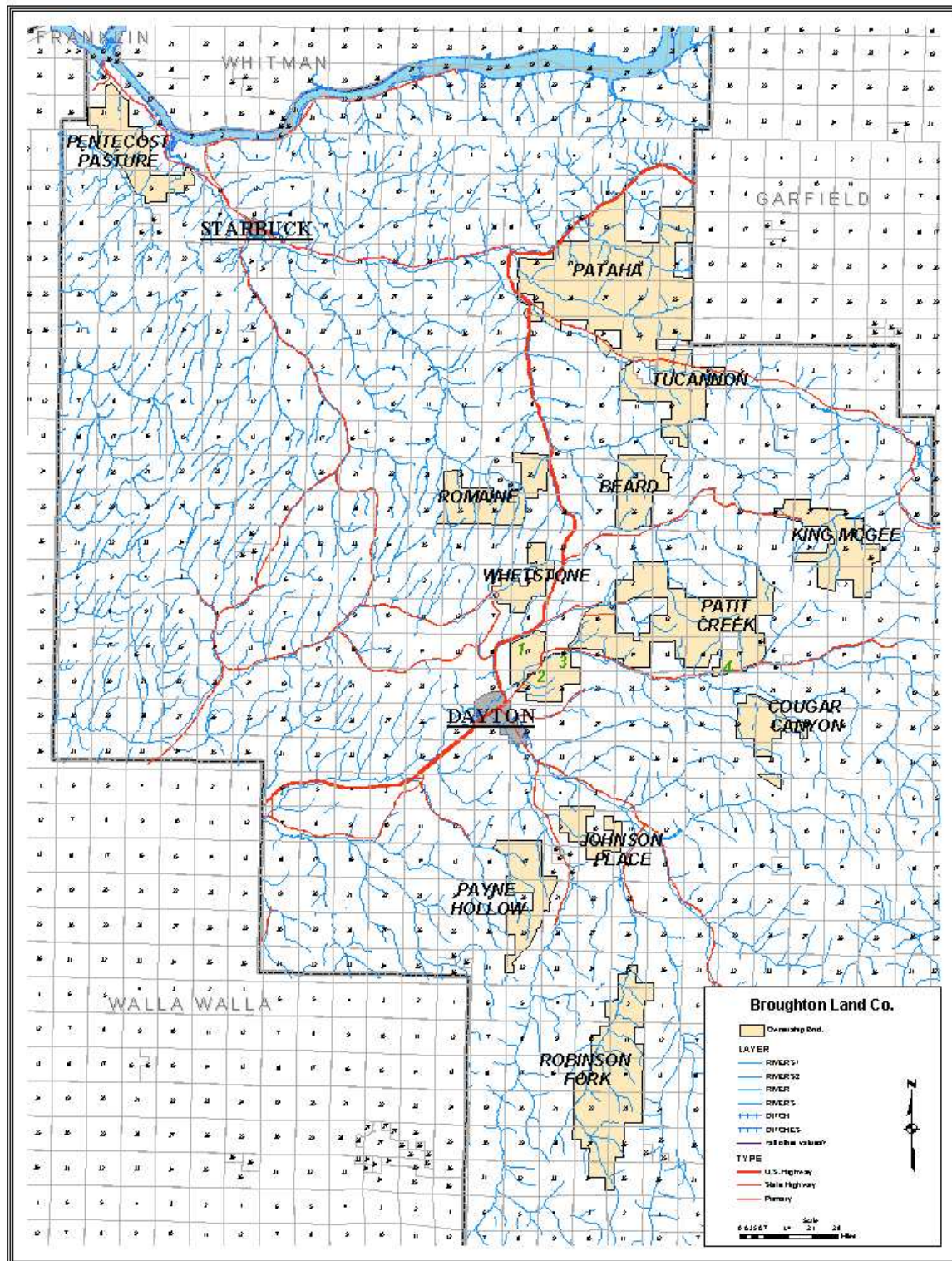
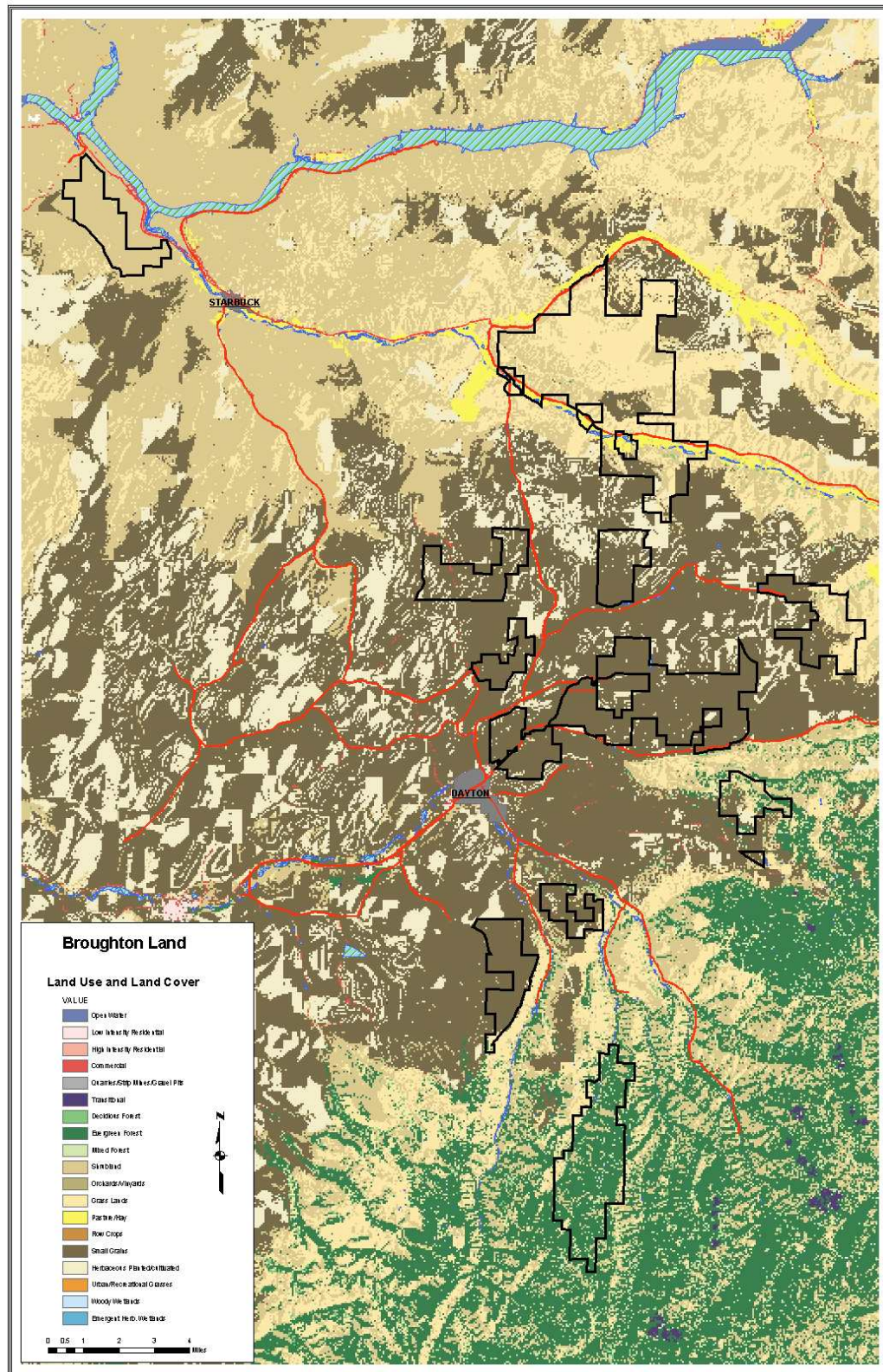


Figure 14. Land Use and Land Cover Associated with the BLC Lands



The BLC has two principal dryland pasture areas: the Pentecost Pasture located near the Snake River, and lands near and bordering Pataha Creek and the Tucannon River. These dryland areas are internally drained only by ephemeral gulches bordered by grasses, forbs, and in some areas, brush species. Narrow bottomland irrigated alfalfa and grass hay lands also occur along the Tucannon. Cattle have no access to intermittent or perennial streams in the Pentecost pasture, no access to Pataha Creek and only very limited access to parts of one of the four blocks of Broughton land bordering the Tucannon River (See subsection 3.4.3.3 for further discussion of Tucannon grazing management). In its “pre-settlement condition, Pataha Creek was likely bordered by dense brush and deciduous forest, but is currently only partially bordered by brush and dense grass/forbs (Pomeroy Conservation District 1997).

The company’s forestlands are located in the Robinson Fork of the Touchet River.¹⁷ These lands are managed for an annual flow of logs, primarily employing partial cut silvicultural systems. The BLC’s road system necessary for management of these lands is nearly complete, with exception of areas at the upper end of BLC’s lands near and bordering National Forest lands. Areas to the east of the Robinson Fork near and bordering Umatilla Tribe lands would be accessed via existing ridge top roads or with helicopters, with little if any new road construction envisioned. The BLC also grazes cattle in these forestlands for part of each year, generally beginning early in June and ending in November.

Agricultural lands are found in the moderate precipitation areas between the dry pastures and forestlands. The BLC’s lands and most of the lands of Columbia County have been severely eroded from the time they were first tilled to the 1980’s. It was a common practice to fallow farmland (grow no crop for 1 year) and till the soil many times to control weeds and prepare a seed bed for the next crop. BLC has now implemented a cropping plan that has minimized soil erosion, as described in subsection 3.4.1.1. BLC’s improved conservation practices contrast with those that continue to be used in many areas of Columbia County and other areas of Washington where erosion and delivery to streams is still a problem.

The BLC farms the suitable uplands, raising dryland wheat, pea, and barley. Irrigated bottomlands are occupied by grass or alfalfa. Small ephemeral draws in the upland farmed areas are maintained as grassed waterways to prevent channel and gully erosion. Larger channels, as they become intermittent and/or perennial, also become capable of supporting perennial brush and tree stands, and are buffered from surrounding fields with those species. In many areas bordering several streams, current riparian vegetative condition within BLC lands exists in a state of early to advanced recovery from degraded conditions that existed historically due to old and abandoned farming and land management practices, many of which predate BLC ownership of these lands. Current vegetative condition and contributing management practices are described in detail for each stream in subsections 6.2.1 through 6.2.12 of this EA/HCP.

¹⁷ Some areas in the dry crop agriculture blocks of BLC’s lands were retired from crop or concentrated grazing uses years ago and planted to trees. However, it will be 40 years or more before commercial harvest of trees is considered for these areas.

6.1.2.1 Effects of the Wildfire of 2006

In the summer of 2006 the Columbia Complex wildfire swept through about a third of BLC's lands, mainly the Robinson Fork and other forest areas, burning much of the timber. The Columbia Complex wildfire of 2006 burned about 10,000 acres of BLC's holdings, including the Robinson Fork, other forest areas, and some of the range and crop plantings. The damage from the fire was patchy. The riparian areas of the major streams did not burn. The ephemeral side streams in Payne Hollow and in the Patit watershed burned hard. Cougar Canyon burned but the riparian area did not burn hot. The tree farms were a total loss. The damage in the forest lands varied. Some patches were not burned, some burned hot killing all the timber and understory vegetation, and others were burned to various degrees between. Assessment of the damages and probable effects is not complete at the time that this document is being readied for public review. Table 2, a summary of the timber types and volumes, is no longer accurate, but cannot be adjusted with the information now available. Appendix 6 summarizes timber condition and wildfire damage in the Robinson Fork parcels. It is not yet known the extent to which the hydrology and water quality will be affected as a result of the fire.

The side streams in Payne Hollow and Patit watershed that burned may erode and deposit sediments into the mainstem streams. Because the wildfire denuded many of the slopes surrounding Robinson Fork, it is anticipated that there may have been considerable erosion and sediment input to the stream during the winter of 2006/2007 and spring of 2007. This may have caused scouring of the stream bottom and left major sediment deposits, diminishing the suitability of the stream for steelhead spawning, and reducing the chance of establishing bull trout use. Because of the loss of riparian vegetation, shade will be reduced, likely resulting in increased water temperatures. Sediment input and transport would be expected to increase.

As the burned streamside revegetates, the riparian area will increasingly shade the streams, reducing water temperatures to current levels reduced to the extent they are currently elevated due to fire effects. As the riparian area and surrounding upland revegetate, erosion and sediment input will be reduced to the extent they are currently elevated due to fire effects.

BLC anticipates promptly salvage harvesting the timber that was killed or is dying as a result of the fire, starting with the most seriously burned, particularly those with ponderosa pine. Most of the timber to be salvaged occurs in areas that can be tractor harvested with minor areas that will need helicopter or skyline harvest. On steeper slopes BLC will contour fall whips and poles every 50 to 60 vertical feet and seed with grass to minimize erosion. Where available, live trees will be left as seed sources for regeneration. Other areas will be replanted with seedling stock.

BLC intends to place the mainstem Robinson Fork in CREP, fencing the entirety to exclude livestock. This will protect the regrowth of riparian vegetation from herbivory, and trampling, facilitating more rapid regrowth and shading of the water. It will also protect the banks from trampling and minimize sedimentation into the stream, helping return the stream bed to suitability for steelhead spawning.

6.2 Description of Individual Parcels and Watersheds

6.2.1 Pentecost Pasture

The Pentecost Pasture area is a 2,717-acre contiguous block of BLC's ownership. It is located in the northwest corner of Columbia County near the Snake River, and is used entirely as dry pastureland, as mean annual rainfall is less than 12-inches. Cattle are grazed seasonally on the area. The pasture is grazed primarily in the winter and spring, since it is in a very arid part of the county. The pasture is fenced into cells that can be seasonally rotated for grazing. Generally, the entire pasture is rested during the dry summer and fall months.

The Pentecost pasture drains about equally into two areas: Fields Gulch, and unnamed ephemeral disconnected tributaries facing into the Snake River. Fields Gulch drains into the Snake River approximately 4.5 miles downstream from the nearest BLC property. The BLC lands in the Fields Gulch watershed face into and border an ephemeral tributary of the main Gulch. Fish are not known to occur in Fields Gulch, and certainly do not occur in this tributary. The Gulch itself can best be described as a dryland wash. Habitat quality is degraded by the adjacent county road (See Appendix 1, photodocumentary).



Dry sites with perennial bunch grasses characterize much of Broughton's grazing lands.

In addition to Fields Gulch, BLC lands also face northeast towards the Snake River. However, these break land slopes are separated from the Snake by at least 1,000-feet, and are drained only by ephemeral first order draws that do not reach the river. Rather, these draws drain into dry sinks that formed from Pleistocene era Missoula flood sand and gravel deposits. A minor amount of the Pasture (about 250 acres) also drains via first order ephemeral draws to the Tucannon River within 1 mile of its confluence with the Snake. These lands are separated from the river by at least 500-feet.

6.2.2 Pataha Creek

Pataha Creek is a 185-mi² tributary of the Tucannon River, joining it approximately 11 miles upstream of its confluence with the Snake. The channel and riparian conditions of Pataha Creek are generally degraded for at least 30 miles above the Tucannon, although the Pomeroy Conservation District and landowners have taken actions in recent years to improve these conditions. BLC owns approximately 8,000 acres in this block, with lands bordering the south

bank of Pataha Creek about 1-mile upstream from its confluence with the Tucannon River, and with lands in tributary watersheds draining to Pataha Creek for approximately the next 5 miles.¹⁸

BLC lands in the Pataha watershed are predominantly used for grazing, with a minor acreage of dry croplands on ridges and north slopes in the southern part of the block. This pasture is also fenced into different cells that are seasonally rotated for grazing. The area receives 12 to 15 inches of precipitation annually, which allows for year-round grazing as long as the cells are managed and rotated.

Pataha Creek is incised into its surrounding valley to a depth of 15- to 30-feet from its mouth upstream for 30 miles or more due to surrounding land management practices. These include channelization, devegetation of stream banks and riparian areas by agriculture and grazing, and removal of channel obstructions and large woody debris (LWD). Within the 2 miles of channel bordered by BLC lands, the streambed has become relatively stable, and riparian vegetation is forming in the 40- to 100 foot-wide floodplain that has developed between the surrounding vertical channel banks. This vegetation consists of dense wheat, canary, and other introduced grasses, and native willow, cottonwood, hawthorn, rose and other shrub and tree species. The tree and shrub community is generally young and only partially developed, and limited to the new floodplain. To accelerate and further assure rapid revegetation, these areas were planted to cottonwood and willow in 2001 and are expected to rapidly develop a richly vegetated and diverse riparian vegetative community (USDI 1998; Beschta 1997; Keller et al. 1978). Stream banks and edges of the surrounding original valley areas are expected to revegetate over time, as the stream banks slough and regrade themselves to more normal slope angles. This process can be observed in an older and more advanced state immediately upstream of BLC lands.

HCP conservation measures implemented as part of this plan are intended to ensure that channel recovery processes currently in early stages continue to advance at a rapid rate through the area bordered by BLC. In 2003 BLC enrolled the area between Pataha Creek and Highway 12 in CREP, eliminated grazing in that piece, and developed an upland water source south of Highway 12.

Three intermittent tributaries drain BLC lands to Pataha Creek: Dry Gulch, Miller Gulch, and Chard Gulch. All three tributaries pass under Highway 12 within 1,000 feet of entering Pataha Creek. Because Pataha Creek has incised itself so deeply, the tributaries have also cut down to meet Pataha Creek's elevation. The downcutting is limited to the zone between Highway 12 and Pataha Creek. Above the highway, the streams are stable and reasonably well vegetated with a grass/forb community characteristic of this low precipitation zone.

6.2.3 Tucannon River

BLC owns two blocks of land tributary to the Tucannon. BLC lands drain to the Tucannon via two intermittent tributaries approximately 23 miles upstream from its confluence with the Snake. These lands are managed for dry croplands on the gentle terraces, with the steeper canyon slopes

¹⁸ A few acres of BLC land extend to the north bank of Pataha Creek in the northwest corner of Section 21, T12N, R39W. These lands are unmanaged and have recently been placed into CRP.

managed as grazing areas. These lands are also briefly described in the following section entitled “King/McGee.”

Further downstream, between 13 and 21 miles upstream of the Tucannon/Snake confluence, BLC owns approximately 4,500 acres that lie adjacent to or near the river. These lands are used for grazing, with irrigated pasture in the river’s floodplain. These lands border the river in four separate units (identified as Tucannon Block #’s 1 through 4, and mapped as such in Figure 13), and each of these is described here, beginning with the lands located furthest downstream, working upriver.

The first section of BLC land, Block #1, borders the river for nearly 1 mile near the mouth of Willow Creek in Section 29, T12N, R39W. The lands to the south of the river and adjacent to Willow Creek are irrigated hay and pasture. The riparian area bordering the river is variable in width, ranging from over 100 feet of richly developed deciduous forest and undergrowth to approximately 50-feet of grass/forb and scoured gravel areas. The narrower and less vegetated areas occur where the river has eroded and scoured streambeds and banks, most recently in 1997, and these areas are fully exposed to solar radiation from the south. Areas on both the south and north banks have been channelized and revetted with rock riprap and logs in some locations in a partially successful effort to stabilize the eroding bank (see photodocumentary Appendix 1a-1d).

The lands immediately bordering the river to the north are used for irrigated hay and pasture. As with all other Tucannon River blocks that border the river to the north, floodplains and abandoned floodplain terraces lie between the river and the paved county road. Steep breaklands generally lie to the north of the county road, and BLC and other landowners manage these areas as rangelands. The riparian area in this area of BLC land to the north of the river is approximately 100-feet wide, and composed of richly developed deciduous forest, shrubs, and grass/forb communities.

The second area of BLC land, Block #2, borders on the north side of the river beginning approximately 300-feet upstream of the first area for approximately 3,000 feet in Sections 32 and 33, T12N, R39W. BLC irrigated alfalfa in this area is separated from the river by 100- to 200-feet of dense grasslands that lie on BLC land, a fence, and a relatively wide (60- to 100-feet), forested riparian area belonging to another owner.

The third area of BLC land, Block #3, borders the north side of the river 1 mile upstream of the second area, and extends for approximately 3,000 feet in Section 34, T12N, R39W and Section 3, T11N, R39W. The south bank of the river in this third area is not owned by BLC, and is steep breaklands with narrow and discontinuous valley bottom area. On the BLC land to the north of the river, fenced riparian forest 30- to 100-feet wide separates the river from irrigated alfalfa that occupies flat ground. Much of the north stream bank was stabilized with large boulders following the 1964 flood.

The fourth and most upstream area of BLC land, Block #4, borders the river about 1.7 miles upstream of the third area, and extends along both sides of the river for over 2 miles through Section 1, T11N, R39W, and Section 6, T11N, R40W. Like the second and third areas, the fourth area is bordered to the south by steep breaklands vegetated with grass/forb and brush

communities. However, the valley bottom is generally wide enough to provide for a more highly developed riparian forest. Fenced riparian deciduous forest separates the river from BLC's irrigated grass fields to the north of the river. The slopes to the south of the river are fenced at the top of the slope. Until November of 2001, BLC allowed winter access through gates into the area during severe winter weather in some years. The cattle crossed the river at limited locations within a ½ mile-long reach to access feed placed for them in the fields to the north of the river. These grazing uses were eliminated in 2002 when Broughton placed the area within 75-feet of the normal high water channel banks within the CREP program. The area has been fenced and will remain within the program for at least 15 years, and possibly longer as further discussed in this document and the proposed HCP. BLC also replaced their irrigation pump screens in 2003 to meet current fish criteria, and in 2004 conserved a portion of their water right (6.4cfs) instream after implementing irrigation efficiency measures.

6.2.4 King/McGee

This approximately 1,800-acre block of BLC land is drained by ephemeral and intermittent tributaries of the Tucannon River and by an intermittent tributary at the extreme headwaters of Willow Creek. These lands are managed for dry croplands on the gentle terraces, with the steeper canyon slopes managed as rangelands. Willow Creek flows through a grassed waterway that is densely occupied by crested wheatgrass that was planted and is maintained to control erosion. Willow Creek is surrounded by nearly flat land where it exits BLC ownership. The waterways extend upstream into rolling croplands and remain well vegetated and stable throughout their length.¹⁹

6.2.5 Beard Block

This 1,568-acre block of BLC land is drained by ephemeral tributaries to Willow Creek (intermittent) and Whetstone Creek, and borders the north bank of Whetstone Creek for 1 mile. Whetstone Creek is seasonally intermittent in this area and for several miles downstream. The Beard Block is managed for dry croplands on rolling hills with some flat valley bottomlands near Whetstone Creek. Whetstone Creek flows through a well-vegetated crested wheatgrass grassed waterway surrounded by nearly flat land throughout the area.

6.2.6 Romaine Block

This 1,792-acre block of BLC land is drained by ephemeral and intermittent tributaries to Smith Hollow Creek (perennial), and one ephemeral tributary of Willow Creek (intermittent). These lands are managed for dry croplands on gentle slopes, with one small area of brush and grass/forb rangeland on steeper slopes adjacent to the one intermittent tributary of Smith Hollow Creek that occurs on BLC land. This intermittent tributary is bordered by dense, brushy, and relatively wide, canyon-bottom, riparian vegetation. Smith Hollow Creek drains into the Tucannon River approximately eight miles from the Snake River, about 8 miles downstream of

¹⁹ Grassed waterways (also referred to as vegetated waterways) are a key element of erosion control in croplands where the basic approach to gully control involves field protection practices that limit surface runoff volume, velocity and generation of eroded sediments, and waterways that are densely vegetated to control erosive forces of water within headwater draws and channels.

BLC lands, and is severely degraded for several miles due to past and present management practices adjacent to the degraded areas (see photodocumentary). BLC lands drained by the single intermittent tributary of Willow Creek were retired from grazing uses years ago to control erosion and the steep slopes that border the tributary are not farmed. The tributary itself is a dry wash, and is degraded by an adjacent county road.

6.2.7 Whetstone

This 916-acre block of BLC land borders both sides of Whetstone Creek for approximately 1 mile. Whetstone Creek remains seasonally intermittent in this area and for several miles downstream. The Whetstone Block is managed for dry croplands on rolling hills, with the flat valley bottomlands adjacent to Whetstone Creek managed in irrigated grass and alfalfa. BLC lands in the Whetstone Block are not grazed, and the channel flows through a well-vegetated grassed waterway surrounded by nearly flat land throughout the area. In 2003, BLC surfaced a road to minimize sediment input to streams.

6.2.8 Patit Creek

This large and complex block of BLC ownership lies along Patit Creek just upstream from Dayton, with some land in the Whetstone and Johnson Hollow watersheds. BLC land in both Johnson Hollow (a tributary of Patit) and Whetstone Creek are drained by ephemeral tributaries, and are managed for dry croplands with grassed waterways. Because stream channel conditions and BLC management practices vary considerably along Patit Creek, each distinctive reach, or block is described.

Two areas of BLC lands border Patit Creek. The first and most downstream area lies immediately upstream of the city of Dayton and borders Patit Creek on one or both sides of the stream for approximately 2 stream miles.

The BLC property on both sides of Patit Creek Block #1 is irrigated pasture. The source of irrigation water is waste process water from the food processing plant located to the west in Dayton. BLC does not withdraw surface water from Patit Creek for irrigation, with exception of occasional watering of the lawn bordering its headquarters buildings that withdraws no more than 0.02 cfs.²⁰

Patit Creek in this block appears to be perennial, but contains areas without surface flows during some dry years. Such areas were observed further upstream above Section 16 (Patit Block #2). Steelhead are known to occupy Patit Creek. The channel has cut down and widened within a wide historic floodplain, and appears to have been straightened decades ago; some degree of bank erosion continues. The streambed of Patit Creek in this area is characterized by stable basalt cobble with few deposits of fines, and is cut to bedrock controls at isolated points. Pools are rare and shallow. Large wood debris is nearly absent. The streambed and banks are generally stable, although some areas of instability and vertical banks occur. Mid-summer shade averages approximately 20 percent, and will increase as riparian shrubs and trees become more

²⁰ This pump is screened to the current 2003 NOAA standard requiring no larger than 3/32-inch openings.

dense and mature. In 2005, BLC enrolled the riparian area in CREP, and in 2005 and 2006 BLC widened the fencing. A CCC erosion control structure constructed in the 1930's that posed a partial fish barrier was removed from this reach in 2003 in cooperation with the WDFW. Rock surfacing was added to the road in section 20 in 2004.

Block #2, the second and relatively short reach of Patit Creek is located in Section 17, T10N, R39W. It extends upstream from Block #1 above the county bridge and adjacent to Broughton Lane and Broughton Ranch headquarters buildings further upstream. Riparian brush and tree species (willow, cottonwood, hawthorn, etc.) are well developed and dispersed throughout the riparian area, and both banks and beds are stable. The stream is heavily shaded. This area was placed into the CREP program in 2002.

The third block of Patit Creek extends above Block #2 for $\frac{3}{4}$ mile through Section 16. BLC lands border the stream to the south, with 1,000 feet of land at the upstream end also bordered to the north. Lewis and Clark actually camped at this site on their westward journey to the Pacific Ocean in 1804.



This dam, a possible fish barrier, was removed late in 2001. In its place there is now a series of in-stream structures to facilitate fish passage and provide resting pools.



Like Block #2, the adjacent BLC property to the south of Block #3 is irrigated pasture. This area was placed into the CREP program in 2003. A fence was constructed 75-feet from the channel's ordinary high water mark in 2003, and 2007, and the area within the fence was planted to trees and shrubs as specified in the CREP program contract for this area.

The fourth block of Patit Creek lies 4 miles upstream of Patit Block #3, and extends for 1 mile in parts of the N1/2, Sections 19 and 20, T10N, R40W. This is the most upstream area of BLC land that borders Patit Creek. A county road parallels the stream on its north side, but is generally well separated from the creek by a richly developed shrub and small deciduous tree riparian

zone. BLC grows dryland wheat and peas on both sides of the stream on flat to nearly flat alluvial terraces that border the stream in many areas. BLC occasionally fords the stream at two shallow, cobble-bedded, stable locations with farm equipment. While the stream channel is generally stable and the immediately adjacent riparian zone is well vegetated, vertical stream banks remain somewhat unstable and bare in several areas because these areas are farmed to the edge of the banks. Providing a vegetated buffer between the cropland and the stream banks could eliminate this situation, therefore BLC has realigned the farmed area to include an average 50-foot buffer on either side of the vertical stream banks. Several ephemeral and intermittent tributaries of Patit Creek that originate on and/or flow through BLC lands evidence past instability and downcutting. However, these channels are now well-vegetated and stabilized due to conversion from grazing and farming uses adjacent to channels and on the steeper hillsides, and establishment of dense riparian vegetation.

6.2.9 Cougar Canyon

Cougar Canyon is an intermittent tributary to the South Fork (sometimes called the West Fork) of Patit Creek that joins Patit Creek ½ mile downstream of Patit Block #4. BLC owns approximately 1,250 acres along and tributary to the canyon. Fish occupancy within Cougar Canyon is unknown, although use by steelhead and redband trout is possible. However, the channel of the South Fork is severely degraded and exposed, with warm water temperatures. These channel conditions were also observed for Cougar Canyon where it joins the South Fork due to adjacent land management downstream of BLC ownership. BLC owns land along more than 2 miles of the main channel of Cougar Canyon, beginning ½ mile above the mouth, and surrounding ephemeral tributaries. BLC also manages approximately 60 acres of gentle ridge top lands in this block as dry cropland. BLC acreage that borders virtually all stream channels within the block was converted to grassland and forestland several years ago. Steep slopes and riparian areas have become very well vegetated with brush and small trees, and channel conditions continue to stabilize and recover from historic land use effects. Although the area has not been grazed in recent years, BLC is considering seasonal grazing of cattle and selective timber harvest in the area in the future. Both decisions will be regarded as a “changed circumstance” and addressed as set forth in Chapter 3, Table 12.

6.2.10 Johnson Place

Two ephemeral headwater channels, one leading to the South Fork and one leading to the North Fork of the Touchet River, drain this 917-acre block of BLC dry cropland. A portion of these lands also extends towards the Wolf Fork of the Touchet, but no stream channels lie in that area. The uppermost reaches of the ephemeral channels in the block are bordered by grassed waterways that lead to brushy riparian areas bordering the channels where they become steeper and more deeply defined as they exit BLC property.

6.2.11 Payne Hollow

This approximately 2,400 acre block of BLC land lies along ephemeral and intermittent channels at the extreme headwaters of Payne Hollow, with minor acreage along an ephemeral headwater tributary of Whiskey Creek. Payne Hollow is an intermittently flowing tributary that joins the

Touchet River 3 miles downstream of Dayton. BLC manages this block as dry cropland, although extensive areas of steeper slopes adjacent to the main stem and tributaries of Payne Hollow are managed as conifer (ponderosa pine and Douglas-fir) forest and grassland areas, some of which are grazed seasonally.

6.2.12 Robinson Fork

BLC owns 5,162 acres of forestland tributary to and surrounding the Robinson Fork of the South Fork of the Touchet River. BLC lands adjacent to the river begin 1.5 miles above its confluence with the Wolf Fork that in turn flows into the South Fork 2.5 miles further downstream. These lands have been managed by BLC for over 70 years for a near-continuous flow of timber. Significant floods in the past 50 years occurred in 1964, 1965, 1969, 1996, and 1997. All were associated with mid-winter rain-on-snow circumstances. Larger channels throughout the Touchet River watershed, including Robinson Fork, experienced significant shifting, braiding, downcutting, channel widening, and loss of channel-adjacent riparian vegetation (Reckendorf and Associates 2000; WDNR 1998). Braiding of the Robinson Fork is limited to the lower ½ mile above the Wolf Fork, 2 miles downstream of BLC ownership.

The Robinson Fork within some areas of BLC ownership has not yet recovered from the effects of the 1996 floods. A major logging road closely paralleled the Robinson Fork through BLC lands for several miles. This road was severely impacted by the 1996 flood, including loss of all 13 bridges that crossed the river, and loss of the roadbed due to channel erosion in several areas within the lower miles of BLC ownership. Old log landings and skid trails also were severely affected during this major rain-on-snow flood. Loss of mature conifers and their root systems from the riparian zone due to the road and historic logging practices interacted with the flood to further contribute to channel damage.

Riparian vegetation adjacent to the Robinson Fork has been altered substantially from native conditions. Past harvest and location of roads, skid trails, and landings on the banks and in the riparian zone of the Robinson Fork have reduced the height and density of the riparian forest, reducing stream shade, large woody debris recruitment potential, and bank stability (WDNR 1998). The 1996 floods also contributed to these disturbed conditions.

In addition to effects on channel and bank stability, the old valley bottom road (“the Bottom Road”) was, while active, responsible for the majority of surface erosion sediment contributed to the Robinson Fork from BLC ownership (WDNR 1998). Depending on the modeling assumption scenarios reviewed by the WDNR (1998), road and slope surface erosion (the latter being dominated by skid trail erosion and minor in comparison to road erosion) in the Robinson Fork exceeded natural rates of watershed surface erosion by 320 to 1,500 percent. These are very high percentage increases compared to most results reported for similar watershed analyses conducted in watersheds east of the Cascade Mountains in Washington, Idaho, and Montana (McGreer et. al. 1998). However, the Bottom Road is no longer being actively used for logging traffic, and with abandonment and closure of the lower 2 miles of the road, elimination of log trucks and logging machinery, and limitation to light management and recreational uses, the Bottom Road would contribute only minor amounts of sediment to the Robinson Fork. The light administrative use does allow some vehicle crossing at fords in the Robinson Fork, which will

continue to have potential to impact water quality or fish habitats. BLC continues to cooperate with WDFW to allow stream surveys or spawning surveys within Robinson Fork.

Debris flows during the 1996 flood added huge amounts of basalt gravel, cobble, and boulders to the Robinson Fork and other forks of the Touchet River system. Highly mobile during the flood, these materials also contributed to channel and riparian area damage, and are not yet fully stabilized by riparian regrowth. Historic log skidding down steep first and second order tributaries and poorly constructed roads on slopes steeper than 50 percent contributed to the occurrence of many of these failures. These logging and road related causes are essentially eliminated by the prescriptions imposed as a result of the watershed assessment (WDNR 1998). Failures also occurred naturally within the watershed, and many originated within steep grassland slopes not owned by BLC (WDNR 1998).

Logging and road related causes of sediment are essentially eliminated by the mandatory prescriptions imposed as a result of the watershed assessment (WDNR 1998).²¹ These prescriptions include elimination of log skid trails from within and near side-slope draws that were found to be the major triggering mechanism for mass wasting and soil erosion in these draws; tree retention soil disturbance, and soil revegetation requirements near draws; elimination of roads on slopes steeper than 50 percent within (two) ancient deep-seated landslides unless approved by a geotechnical expert;²² Broughton complies with each of these prescriptions in compliance with Washington State law and as terms of this HCP.

Detailed background on BLC's forest management practices are provided in section 3.4.2.1. Currently BLC follows the Forest Practices Rules (WFPB 2001), and the South Fork Touchet River watershed analysis mass wasting prescriptions. Timber cruise data presented by Creative Resource Solutions show that of the 5,162 acres of land within Robinson Fork, 3,629 can be considered capable of producing commercial crops of timber on a sustained basis. Of this acreage, 3,354 had some timber of harvestable size on it prior to the fire.

In the summer of 2006 the Columbia Complex wildfire swept through about 10,000 acres of BLC's holdings, including the Robinson Fork, other forest areas, plus some of the range and crop plantings. In Robinson Fork and other areas where stands of young trees had been established, much mature timber and virtually all reproduction was killed. As with most forest fires, the damage from the fire was patchy. Assessment of the damages and probable effects is not complete at the time that this document is being readied for public review. Appendix 6 summarizes timber condition and wildfire damage in the Robinson Fork parcels.

Prior to the fire, BLC managed Robinson Fork through relatively frequent entries using the existing road system to selectively harvest mature timber along with trees that were at risk to insects or disease. The exception is in the southern quarter of the commercial forestland within

²¹ Washington's watershed analysis procedures mandatorily require that all landscape hazards be assessed by trained and certified experts, and that management prescriptions be prepared and imposed on the specific geographic areas where the hazards occur, as mapped by these experts. Jack Powell, the WA DNR State Geologist, mapped the Robinson Fork landslide hazards and led development of the prescriptions that mitigate these hazards, as required by the states Forest Practices Act.

²² Washington State law now requires that such an expert be licensed as an Engineering Geologist.

the drainage. There, timber harvests have not taken place since at least 40 years ago (Creative Resource Solutions “Newby Mountain Timber Valuation”, 1999).

Normally, BLC would have continued their frequent entries for relatively small volumes of timber in Robinson Fork. However, the Columbia Complex fire in 2006, resulted in a decision to salvage the timber killed by the fire. The BLC anticipates promptly salvage harvesting the timber that was killed or is dying as a result of the fire, starting with the most seriously burned, particularly those with ponderosa pine. Most of the timber to be salvaged occurs in areas that can be tractor harvested with minor areas that will need helicopter or skyline harvest. On steeper slopes BLC will contour fall whips and poles every 50 to 60 vertical feet and seed with grass to minimize erosion. Where available, live trees will be left as seed sources for regeneration. Other areas will be replanted with seedling stock.

Large fires are normal in the Blue Mountains. Sediment delivery to streams may occur after a fire, usually through “pulse” events, such as summer thunderstorms or heavy winter rains. Forbs and grasses have recolonized the site and in the winter immediately following the fire, little additional sediment was noted in the stream. However, large storms or rain on snow events may well happen and could cause short-term, “pulse” impacts which are unpreventable.

Unburned pockets of timber will continue to grow and represent timber that can be harvested, although volumes harvested will likely be far less than if the entire watershed contained timber with a distribution of age classes that would allow for a sustainable harvest equal to the annual growth. Timber harvests within Robinson Fork after the salvage of fire-killed timber is complete will be infrequent and small. BLC expects that in burned areas the timber will grow and recover, reaching an approximate total sawtimber growth in Robinson Fork will approach 2.6 million board feet per year (based on 3,629 acres of commercial forest land). This may take 50 years or more (HCP section 3.4.2.1). While BLC plans to move toward a selective harvest and partial cut regime similar to that described above, due to forest regeneration times much of the Robinson Fork would not be available for harvest during the life of the HCP. The burned areas may receive precommercial or commercial thinning treatments. It is impossible to predict harvest volumes and possible dates at this time. All harvests will be conducted in compliance with the Washington Forest Practice Act rules in existence at the time.

Through 2006, cattle grazed the Robinson Fork watershed seasonally and have impacted channel banks, and riparian grass, forbs, and brush to an unquantified degree. Cattle were allowed to graze the area each year beginning around July 1 and are removed in early November. Historically, BLC has grazed 300 to 350 cow/calf pairs in the Robinson Fork. Since the 2006 fire, BLC has enrolled the mainstem Robinson Fork in CREP, and plans to fence the entirety of the buffer to exclude livestock for the life of the contract (15 years). This will protect the regrowth of riparian vegetation from herbivory, and trampling, facilitating more rapid regrowth and shading of the water. It will also protect the banks from trampling and minimize sedimentation into the stream, helping restore the stream bed for potential steelhead spawning. At the end of the CREP contract period, BLC will revisit the grazing management in Robinson Fork, with a goal to ensure that riparian habitat is maintained.

6.3 Aquatic and Riparian Species

Columbia County and BLC's lands within it are occupied by a wide array of terrestrial and aquatic species. Distribution of terrestrial species varies substantially, primarily with elevation, temperature, and precipitation regime, which also largely determine the basic land uses that occur on BLC's lands: grazing (pasture lands), farming (crop lands), and forestry (forest lands). Species distribution is also affected by certain rare habitats such as rock talus and cliffs. Distribution of aquatic species within the streams affected by BLC lands is determined primarily by streamflow regime (perennial, intermittent, ephemeral), water temperature, and channel characteristics such as habitat elements (pools, riffles, glides), channel stability, relative abundance of large woody debris and cover. To some degree species distribution is also affected by access and migration factors, including adjacency to larger fish-bearing waters such as the Snake, Touchet, and Tucannon Rivers.

Detailed maps of Columbia County wetlands and wildlife habitats for the areas covering and within 1 mile of BLC lands are provided by 1999 Washington Department of Fish and Wildlife (WDFW) and U.S. Department of Agriculture, Natural Resource Conservation Service (NCRS) project habitat and species maps (WDFW 1999). These maps identify species occurrence, including location of Wildlife Heritage locations. ESA listed endangered, threatened, proposed, candidate, and concern species are provided for Columbia County by the USFWS (2007).

The BLC proposes that the HCP cover three fish species, totaling five listed entities, all of which are "threatened" species:

1. Snake River ESU spring/summer Chinook (*Oncorhynchus tshawytscha*) listed in 1992;
2. Snake River ESU fall Chinook salmon (*Oncorhynchus tshawytscha*) listed in 1992;
3. Snake River ESU steelhead trout (*Oncorhynchus mykiss*) listed 1997;
4. Middle Columbia ESU steelhead trout (*Oncorhynchus mykiss*) listed in 1999.
5. Coterminous U.S. bull trout (*Salvelinus confluentis*) listed in 1998.

Below in Table 15 are the unlisted aquatic species that may be affected, positively or negatively, by the HCP.

Table 15. Aquatic "Species of Concern"

Species	Federal Status	State Status
Margined sculpin (<i>Cottus marginatus</i>)	FSC	SS
Tailed frog (<i>Ascaphus truei</i>)	FSC	--
River lamprey (<i>Lampetra ayresi</i>)	FSC	SC
Pacific lamprey (<i>Lampetra tridentata</i>)	FSC	--
Interior redband trout (<i>Oncorhynchus mykiss gairdneri</i>)	FSC	--

FSC - Federal Species of Concern; SS - State Sensitive; SC - State Candidate

Several inventories and documents provide information on fish presence, absence, and habitat characteristics for streams within and potentially affected by BLC's lands. This information

collectively indicates that fish species covered in the HCP occur in the Snake River,²³ Tucannon River, Pataha Creek (a tributary of the Tucannon), Robinson Fork and tributaries, and Patit Creek (tributaries of the Touchet River system). All other stream systems become intermittent or ephemeral well downstream of BLC lands, and are unlikely to support fish.

The WDFW Habitats and Species Maps show all mileage of the four covered fish stream systems within or downstream of BLC's lands as "priority anadromous and resident fish presence," but do not list the fish present by species. However, other sources generally do provide this information. The WDFW maps also note possible presence of resident fish in the vicinity of BLC lands at the mouth of Willow Creek, Whetstone Creek, and North Patit Creek. However, it is highly unlikely that any of these waters contain bull trout or anadromous species included in this agreement (Glen Mendel, WDFW, 2000, pers. comm.).

Distribution of aquatic species within the streams is determined primarily by habitat elements including streamflow regime (perennial, intermittent, ephemeral), water temperature, channel characteristics (pools, riffles, glides), channel stability, relative abundance of large woody debris and cover. The distribution of aquatic species is also affected by access and migration patterns, including the availability of larger fish-bearing waters such as the Snake, Touchet, and Tucannon Rivers. For purposes of understanding the distribution of covered species, we have grouped our discussion below by watersheds.

There may also be some non-aquatic species that are dependent on or use riparian habitats in Columbia County. The yellow-billed cuckoo (*Coccyzus americanus*) is a candidate bird species that may occur in southeastern Washington, but it may also be extirpated (FWS, 2005). The cuckoo in the western U.S. breeds in large blocks of riparian habitats, particularly woodlands with cottonwoods and willows. The FWS reviewed the WDFW priority habitats and species data base (2006). While bald eagles, currently a threatened species (although proposed for delisting) may use riparian habitats for perches or roosts in Columbia County, there are no known bald eagle nests or communal winter roosts in the area. Osprey may use riparian areas for nesting, and turkey, elk, and mule deer may use riparian areas for cover and forage. Many other non-aquatic species may use riparian habitats, but their presence has not been documented.

The non-aquatic riparian species listed in the preceding paragraph are somewhat generalists, and would likely use the riparian zones in lower elevations such as along Patit Creek, Pataha Creek, and the Tucannon River similarly to higher elevation forested riparian zones such as Robinson Fork. Thus, to minimize redundancy we do not describe them separately by watershed as we do in the next section for aquatic species. In general, these non-aquatic riparian species would be benefited by mature riparian areas with native species.

6.3.1 Tucannon River

The Tucannon River enters the Snake River at RM 62.2. Total watershed area is 498 mi². Mean discharge is 174 cfs, with a mean annual peak flow of 310 cfs, generally occurring in April or

²³ The Snake River near BLC's lands is a reservoir, and more importantly, there is no direct surface water connection of BLC's lands to the river other than via approximately 2 miles of an ephemeral tributary of Fields Gulch. Therefore, the Snake River will not be discussed further in the HCP.

May, and a mean low flow of 61.5 cfs, usually occurring in August or September. Stream temperatures commonly exceed 80°F throughout mid-summer in the lower miles of the river downstream of Pataha Creek (RM 31) (Mendel et al 1993) due to low elevation and the effect of naturally warm air temperatures, naturally occurring thermal-artesian springs, and loss of riparian vegetation. The river continues through agricultural areas upstream of Pataha Creek, but “riparian and water quality improve to levels that will support all life stages of most species of salmonids” (Bonneville Power Administration 2000) as the river approaches the forestlands and the Umatilla National Forest.

Chinook, Spring/summer Run

Spring/summer chinook runs in the Tucannon River were seriously depleted by 1935 from annual runs that totaled up to 30,000 fish prior to 1915 (Columbia Conservation District 1997). Returns continued to decline into the 1990s. Between 1994 and 1999, adult returns declined to an average of 196 fish from an earlier mean of 550 fish between 1985 and 1993. Natural out-migrating smolts (not from hatcheries) declined from a range of 25,900 to 58,200 fish annually for the years 1985-1993 (Bumgarner et al 1997) to an annual mean of 3,000 for the years 1994-1996 (Bonneville Power Administration 2000). All Snake River spring/summer and fall chinook were listed by NMFS in 1992 as threatened.

Spring/summer chinook spawn above RM 12 (Bonneville Power Administration 2000), and limited rearing occurs up to RM 21, above BLC lands.²⁴

The Tucannon River and tributaries support spring/summer Chinook. Dam construction on the Columbia and Snake rivers flooded spawning reaches and blocked passage. Chinook are present in the lower reaches of the Tucannon River. Peak winter and spring flows and spawning gravel quality and stability are limiting factors for spring/summer Chinook. In addition, water withdrawals, logging, and agriculture operations have degraded riparian and in channel habitat. Limiting factors for Chinook include inadequate fish screens. Summer water temperatures in the lower Tucannon River have been critically high.

Chinook, Fall Run

Fall chinook runs were greatly depleted by 1935, but remnant runs continue. Annual redd surveys were conducted by the WDFW from the river’s mouth to RM 17.4 for the years 1985-1996, with as few as zero redds detected in 1985 and 1986, and as many as 61 in 1990. Fall chinook have been seen spawning upstream of Starbuck dam only since 1992, when a fish ladder was reconstructed and made effective (Columbia Conservation District 1997). They have been observed to spawn as far upstream as just above Highway 12 (RM 14) near the lower extent of BLC lands adjacent to the river (Mendel, 2000, pers. comm.).

Generally, fall run Chinook in the Tucannon use the lower mainstem. Threats to the species are as described above for the spring/summer Chinook.

²⁴ BLC lands adjacent to or near the Tucannon extend upstream to RM 20.5.

Steelhead

Wild summer steelhead in the Tucannon River, Pataha Creek, and tributaries are a distinct stock based on the geographical isolation of the spawning population, but the stock has not been considered to be an evolutionarily significant unit (ESU) (WDFW 1993). Although much larger runs are reported to have existed prior to 1935, a good spring run and a small fall run continued in 1935, and prior to 1970, returns of native steelhead were estimated to average 3,400 fish (Columbia Conservation District 1997). Return of both wild and hatchery fish have since declined substantially, and the stock is considered depressed based on chronically low spawner escapement (WDFW 1993). Steelhead have been found to spawn and rear in the Tucannon River above RM17 and in the vicinity of BLC lands adjacent to the river (WDFW 1993).

The Tucannon River and tributaries support Snake River steelhead (Threatened). Juvenile and adult steelhead emigrating from and returning to the Tucannon River is compromised by lower Snake River dams and four Columbia River dams. In general, the habitat quality and complexity within the Tucannon River system is slowly improving for steelhead. Logging, road construction, agriculture, water withdrawals, and cattle grazing continue to affect the quality of available riparian and in-channel habitat. Grazing and agricultural operations (including water withdrawal from the Tucannon River) are conducted on Broughton-managed lands and tributary creeks within this watershed. Warm summer water temperature, low instream flow, in-stream barriers, sedimentation, channel incision, and riparian habitat loss along tributary streams also limit the range of available habitat for steelhead.

Bull Trout

Adult and sub-adult bull trout move downstream through the main stem Tucannon River, including the area bordered by BLC lands, and move upstream to colder headwater areas in the spring. Bull trout spawn above RM 34 (Martin et al 1992; Underwood et al 1995).

The primary existing impacts to bull trout at all of these sites are: 1) lack of large, deep pools with LWD; 2) lack of adequate shade and over-hanging vegetation; 3) lack of off-channel rearing habitat; 4) heavy siltation during storm runoff; 5) general lack of connectivity to the floodplain; and 6) high temperatures. Bull trout require water temperatures below 15° C (59° F) with an optimum for rearing about 8-9° C (46-48° F). Tucannon River water temperatures in the summer are well above these limits, and are not noticeably cooler until about Cummings Creek, at River Mile 35 (Columbia County Conservation District, 2001). Frequently, the Tucannon River contains high amounts of suspended sediments. This usually occurs during spring runoff and during periods of heavy, long duration rains in late spring and intense thunderstorms in early summer.

Lamprey

Pacific lampreys were once abundant in the Columbia River system, but like salmon and steelhead, their abundance is now greatly reduced in the Snake River system. However, they do occur in the Tucannon River; both adults and juveniles have been trapped downstream of Starbuck at the WDFW smolt trap (Columbia County Conservation District 1997). River

lampreys have been found in both the Tucannon and Touchet River systems (Michaelis 1972). Brook lampreys (a resident freshwater species) may also occur in the Tucannon, but there is no documentation of current occurrence (Mendel, 2000, pers. comm.).

Margined Sculpin

Margined sculpin are found in the northern Blue Mountains. They are only found in the Tucannon, Walla Walla, and Umatilla River systems. Nothing is known about their historic distribution. They currently occur in the headwaters and the main stem of the Tucannon bordering BLC ownership (Mongillo and Hallock 1998).

Interior Redband Trout

Redband trout are very difficult to distinguish from steelhead (Mendel, 2000, pers. comm.). Based on presence of suitable habitat, it is likely that they occur in the Tucannon and Touchet River mainstems and perennial tributaries.

Tailed Frogs

Tailed frogs prefer cold-water habitats, and are often found in association with bull trout. No occurrence of tailed frogs within the main stem of the Tucannon River was reported in the literature reviewed for preparation of this report. However, they occur upstream of BLC lands in the headwater streams of the Tucannon (Mendel, 2000, pers. comm.).

6.3.2 Pataha Creek

Pataha Creek is the single largest tributary of the Tucannon River, entering the Tucannon at RM 31. Total watershed area is 185 mi². Pataha Creek is not gauged, but damaging floods occurred in 1950, 1964, 1966, 1971, 1996, and 1997.

Stream temperatures in the mid-70°F range frequently occur in the lower 30 miles of the stream, and the Washington state water quality standard of 64.4° F is exceeded on most summer days in some years at Pomeroy (RM 21) (Pomeroy Conservation District 1997). Stream temperatures and general water quality improve once the stream reaches forestland several miles upstream of Pomeroy (Pomeroy Conservation District 1997).

Because BLC owns land near or tributary to Pataha Creek only in the lowest 4 miles of the stream, discussion is focused on the lower 20 miles downstream of Pomeroy. The Columbia County Conservation District recounts results from a 1994 WDFW electro-fishing survey (Wilms 1994, as referenced in Columbia County Conservation District 1997) and 1994 NRCS habitat notes, and the WDFW conducted an extensive survey in August 1998 (Mendel 1999).

According to the Columbia County Conservation District (1997), no salmonid fish were found in the first 10.7 miles of Pataha Creek in 1994. The stream had only sporadic areas of riparian shade, and was too warm for juvenile salmonid rearing. High nutrient levels likely associated with livestock uses adjacent and in the stream, and warm water, contributed to low levels of

dissolved oxygen. Several water diversions, some of which were not adequately screened, may have contributed to low stream flow. The channel evidenced much bank erosion from livestock and high flows, and the bed had cut down to bedrock in most of this section's length, with depositions of silt and some pockets of gravel. These problems resulted from stream channelization, valley drainage, and conversion from native shrub and forest to grasslands, followed by rapid stream downcutting dating to the early 1900's.

The 1998 WDFW survey also found no salmonid or other fish or amphibian species addressed by this HCP downstream of Pomeroy, although they did find redband trout/steelhead and sculpin upstream of Pomeroy (Mendel 1999).

Chinook

There is no record of either spring/summer or fall chinook occurrence in Pataha Creek, and it may be that the stream is too small to support them (Pomeroy Conservation District 1997).

Steelhead

Adult steelhead have been reported in the main stem of Pataha Creek near RM 40 and RM 24 (Pomeroy Conservation District 1997). BLC lands occur near the mouth of Pataha Creek between RM 2 and RM 4. Steelhead are known to migrate through the area, but there is no evidence of spawning or rearing downstream of Pomeroy (Mendel, 2000, pers. comm.).

Bull Trout

There is no record of bull trout in the Pataha Creek watershed in the references reviewed in preparation of this HCP. Del Groat (Umatilla Nation Forest, 2000, pers. comm.), Umatilla National Forest District Fisheries Biologist, reports that a bull trout was observed in the headwaters of the Pataha Creek watershed in about 1970, but none have been detected since. Downstream of Pomeroy, in Garfield County, stream substrate is sediment laden, and high water temperatures are sustained for extended periods, making it highly unlikely that bull trout would occupy these areas.

Lamprey

There is no record of lampreys in the Pataha Creek watershed in the records reviewed in preparation of this HCP.

Margined Sculpin

There is no record of margined sculpin in the Pataha Creek watershed in the records reviewed in preparation of this HCP.

Interior Redband Trout

Redband trout have been observed in Pataha Creek upstream from Pomeroy, but do not occur in the lower stream miles in the vicinity of BLC property (Mendel 1999).

Tailed Frogs

No occurrence of tailed frogs within the lower 20 miles of Pataha Creek was reported in the literature reviewed for preparation of this report. Because tailed frogs are known to prefer cold-water habitats, lower Pataha does not currently provide suitable habitat. In addition, Del Groat (pers. comm., 2000) reports that tailed frogs have not been observed anywhere in the Pataha Creek watershed.

6.3.3 Robinson Fork

The Robinson Fork is one of the four major headwater forks (North, South, Wolf, and Robinson) of the Touchet River. Each fork drains predominantly forested lands, with range and/or croplands at the lower elevations. The Robinson Fork is a 15.6 mi² tributary to the Wolf Fork that in turn joins the North Fork upstream of Dayton. BLC lands begin at RM 2.4.

Fish habitat problems are described in the South Fork Touchet River watershed analysis (WDNR 1998) applicable to areas of the Robinson Fork downstream from and within BLC ownership. These problems include low frequency of pools and hiding cover due to lack of large woody debris and pool filling by gravels and cobbles, scour and burying of redds during peak flows due to the unstable channel, high levels of fine sediment in spawning gravels, and warm stream temperatures. Past road, grazing, and timber management practices, exacerbated by the 1996 flood, have resulted in low near-term LWD recruitment potential (WDNR 1998).

Summer stream temperatures exceed the Washington state water quality standard of 64.4° F in the lower 6 to 8 miles of the Robinson Fork due to insufficient riparian shade. A temperature of 77° F was observed in the summer of 1999 near the lower end of BLC's lands, and 65° F 6.3 miles further upstream in Section 2, T39N, R8W, near the center of BLC's lands (Mendel et al 2000). Canopy density was assessed in 1997 and ranged from a low of 23 percent in the 2 miles above the Wolf Fork to 72 percent near RM 6, where canopy density was predicted to be adequate to meet the standards (WDNR 1998), which is consistent with WDFW observations (Mendel et al 2000). However, Mendel et al (1999) report "Generally, reaches of the Touchet River above Dayton maintained cool temperatures, in a range favorable to most salmonids, throughout the summer."

Chinook

Chinook were once present in the Touchet River system, but they were eliminated (along with coho salmon) over 50 years ago (Lynch 1995, as cited in WDNR 1998). A few chinook currently occur in the Touchet River system and have been observed in the river upstream of Dayton (Mendel et al 1999). It is not known if these chinook are wild or hatchery fish (Mendel, 2000, pers. comm.).

Steelhead

Middle Columbia steelhead spawning has been documented in the Robinson Fork from the mouth upstream for 5 miles. Juveniles rear further upstream and in the lower ends of tributaries (Mendel et al 2000; WDNR 1998).

Middle Columbia River steelhead (Threatened) are a component of the Walla Walla River stock (Touchet River and Robinson Fork) within Broughton Land Company's holdings. There is chronic depression of the stock because of four Columbia River hydroelectric dams, and long-term habitat degradation and water withdrawal within the Washington portion of the Walla Walla River that keep population levels below potential. This region of the state is also subject to drought and dramatic climatic events that affect steelhead. Logging, roads, and grazing have contributed to riparian habitat loss, sedimentation, and stream channel degradation within Broughton land holdings within the Robinson Fork tract. Dry land farming operations within the Touchet River watershed have contributed to riparian habitat loss, sedimentation, and channel incision in many tributary streams where steelhead presently or historically ranged. Very warm water temperatures in the summer limits the available habitat that can be utilized by steelhead.

Bull Trout

The Walla Walla River Core Area supports two local populations: one in upper Mill Creek and one spanning the North and South Forks of the Walla Walla River. The Touchet River Core Area supports three local populations: one in the North Fork Touchet River, one in the Wolf Fork Touchet River, and one in the South Fork Touchet River (FWS 2004). Bull trout also use the upper Touchet River above the town of Waitsburg, Washington (RM 43) (FWS 2004). In each core area, bull trout exhibit both fluvial and resident life history patterns.

Local residents have indicated that bull trout were once present in the Robinson Fork (WDNR 1998). However, during four surveys conducted in the watershed during the past 20 years, only one bull trout has been reported; this one observation occurred during a WDFW inventory of the Robinson Fork during their 2000 survey; none were detected in 1999 (Mendel et al 2000). During the 1997 WDNR watershed assessment, numerous bull trout were found in the Wolf Fork, a single bull trout was found in the South Fork, and none were found in the Robinson Fork (WDNR 1998). Michaelis (1972) also found bull trout in the Wolf Fork, but not in the Robinson Fork.

Land and water management activities that depress bull trout populations and degrade habitat in this management unit include the operation and maintenance of dams and other diversion structures which modify streamflows and restrict fish passage, forest management, livestock grazing, agriculture, urbanization, and flood control management. Historic, and to a lesser extent current, timber harvest activities, riparian road and railroad construction and use and associated toxic spills, livestock water developments, and fish stocking programs have also been implicated in the decline of the bull trout. Impassable dams and diversion structures isolate and fragment bull trout local populations. Forestry and most other land use activities can impact bull trout through decreased recruitment of large woody debris, increased water temperatures from reduced shading, increased sedimentation, the lack of pools, and habitat connectivity.

Lamprey

A single lamprey ammocoete of unknown species was observed in the Robinson Fork watershed by the WDFW in their 1999 survey of 7 sites (Mendel et al 2000). Michaelis (1972) found no lampreys in the Robinson Fork during his extensive 1972 survey.

Margined Sculpin

Margined sculpin were found throughout the Robinson Fork from the mouth to the headwaters of the main channel in the summer of 1971 (Michaelis 1972), but were found to be uncommon by the WDFW in 1998 (Mendel et al 1999).

Interior Redband Trout

Resident trout have been reported to occur throughout the main stem of the Robinson Fork, along with steelhead (Michaelis 1972; WDNR 1998).

Tailed Frogs

Although no record of tailed frogs appears in the literature reviewed for this HCP, tailed frogs are associated with cool water habitats and are commonly found in association with bull trout. The WDFW found abundant tailed frogs in the upper end of the Robinson Fork and within BLC lands during 1998 and 1999 surveys (Mendel, 2000, pers. comm.).

6.3.4 Patit Creek

Patit Creek is tributary to the Touchet River at Dayton. Patit Creek and its lower tributaries drain rolling, gentle Palouse slopes for several miles upstream from Dayton, although a broad floodplain occurs in the lower miles of the drainage, bounded by steep escarpment breaklands. The South Fork and Cougar Canyon originate in steep canyon and forestlands in the lower slopes of the Blue Mountains. Dry croplands are the predominant land use in the watershed, occurring mainly on the rolling hills. Range and conservation reserve areas occupy the breaklands, and irrigated pasture occurs in the lower reaches of the watershed on the broad floodplain. BLC owns extensive lands in the lower part of the watershed and along Cougar Canyon, a mid-watershed tributary to South Patit Creek. Steeper slopes along the canyon were converted from dry crop and grazing lands to conservation grass and planted trees several years ago.

Patit Creek, even in its lower miles, periodically goes dry in some short reaches, while other reaches remain flowing year-round. It is likely that flow moves subsurface in these areas through relatively deep deposits of unconsolidated and recently deposited stream alluvium. Substrate was observed to be cobble dominated in these areas, with low levels of deposited fine sediments. Exposure of bedrock also occurs.

Because of extremely low summer flows, low elevation and associated hot summer air temperatures, and a continued high degree of solar exposure in some areas, stream temperatures undoubtedly exceed the Washington state water quality standard of 64.4° F throughout Patit

Creek below the North/West fork confluence, and likely beyond. The WDFW observed a temperature of 82° F in late July 1998 upstream from BLC lands prior to the time the stream in this area went dry (Mendel et al 1999). Instream large woody debris and near-term LWD recruitment potential are low (Mendel et al 1999).

Chinook

Chinook were once present in the Touchet River system, but they were eliminated (along with coho salmon) over 50 years ago (Lynch 1995, as cited in WDNR 1998), and the species is considered extirpated in the basin (USACE 1997). However, a few chinook currently occur within the Touchet River system and have been observed in the mainstem upstream of Dayton (Mendel et al 1999). Chinook have never been reported to occur within Patit Creek.

Steelhead

Middle Columbia River steelhead are reported to occur in Patit Creek (Confederated Tribes of the Umatilla Indian Reservation 1990). Concentrated rearing occurs in the South Fork above BLC lands, and two redds were observed in 5.8 miles of the South Fork surveyed in 1999, but no redds were observed in the mainstem anywhere in the vicinity of BLC's lands or elsewhere (Mendel et al 2000).

Bull Trout

There is no record of bull trout occurrence in the Patit Creek watershed in the references reviewed in preparation of this HCP. High sustained water temperatures and extreme low flow conditions make it highly unlikely that bull trout could occupy Patit Creek under current conditions.

Lamprey

There is no record of lamprey occurrence in Patit Creek in the references reviewed in preparation of this HCP.

Margined Sculpin

The WDFW found margined sculpin in the South Fork of Patit Creek during their 1999 survey, but not within the main stem (Mendel et al 2000).

Interior Redband Trout

Resident trout have been reported to occur throughout the main stem of Patit Creek. Although difficult to distinguish from steelhead, redband likely occur in the system (Mendel, 2000, pers. comm.).

Tailed Frogs

There is no record of tailed frogs in Patit Creek in the references reviewed in preparation of this HCP, and their preference for cold water makes it highly unlikely that they occur in the watershed.

Table 16 provides a concise summary for the four stream systems within BLC's lands of stream type (perennial, intermittent, ephemeral) and known species occupancy by life stage. Blank cells in a column of Table 1 indicate that there is no known occurrence of this species for that stream.

Table 16. Summary of Species Considered in Broughton HCP
(Note: blank cells indicate no known occurrence)

Known Species Present	Stream (stream type)				
	Pataha Creek (perennial)	Patit Creek (perennial/intermittent)	Tucannon River (perennial)	Robinson Fork (perennial)	Robinson Fork tributaries (perennial) ²⁵
Listed species covered by HCP					
Steelhead	Snake River Steelhead; Migration	Middle Columbia River Steelhead; Migration	Snake River Steelhead; Spawning Rearing Migration	Middle Columbia River Steelhead; Spawning Rearing Migration	
Chinook			Snake River Spring/ Summer Run; Snake River Fall Run; Spawning Rearing Migration		
Bull trout			Migration	Possible ²⁶	
Additionally benefited species of concern					
Margined Sculpin			Spawning Rearing	Spawning Rearing	
Tailed Frog				Present	
River Lamprey					
Pacific Lamprey				Present	
Redband Trout		Rearing		Spawning Rearing	Spawning Rearing

²⁵ Only perennial tributaries are included, and in these, fish likely occur only near their confluences with the Robinson Fork.

²⁶ See discussion in Section 4.1.7 of the very few recorded observations of bull trout and lampreys in the Robinson Fork.

6.4 Riparian Conditions

Riparian vegetation has been extensively degraded in Columbia County and in many areas that are now in BLC ownership by the historically common practice of farming to the stream bank. Major impacts on riparian vegetation also result from overgrazing, agricultural clearing and herbicides, forest harvest, road construction, flood damage and flood control. Loss of riparian vegetation is a major contributor to increased water temperature and sedimentation throughout the Tucannon and Touchet River systems, although naturally occurring warm air temperatures, and artesian-thermal springs along the Tucannon, also contribute to high temperatures in the river.

Appendix 1 includes photos and descriptions of multiple riparian and stream channel sites on BLC parcels. Information on representative conditions for each waterway in the project area is summarized below. Section 6.2, Description of Individual Parcels and Watersheds, also provides detailed information on the current conditions and management, including riparian conditions, within each watershed in the project area.

6.4.1 Tucannon River (See also subsection 6.2.3)

Riparian Area 1 (about 1,500 feet in length near the mouth of Willow Creek): This area provides a forested riparian zone in parts, as wide as 100-feet. Other parts have eroded, and the channel and stream banks are unstable, and efforts have been made to stabilize the channel with rock and log revetments.

Riparian Area 2 (about 3,000 feet in length on the north bank, upstream of area 1): The north side of the river supports a relatively wide (60- to 100-feet) richly vegetated riparian area, in turn bordered by dense grasslands, and then irrigated alfalfa.

Riparian Area 4 (about 2 miles in length) on the Tucannon River) [Note: photo documentary Appendix 1 skips Area 3]: There is a wide and richly developed riparian forest that lies between BLC's irrigated grass and alfalfa fields to the north. BLC grazes cattle on the lands to the south of the river during the winter, but uses feed and water stations on the high slopes to keep cattle out of the steep slopes and riparian area of the Tucannon River. CREP buffers and fencing installed by BLC in 2002 now prevent cattle access to the riparian zone. Cattle would only be allowed access during emergencies during the CREP contract.

Willow Creek, Tributary to Tucannon River: This incised channel is vegetated, but supports minimal shrubs and trees.

Tributary Intermittent Streams: These streams on BLC lands typically support a well-vegetated riparian area bordered by relatively steep canyon grass/grazed areas, with dryland wheat and peas on gentle slopes above.

Ephemeral Draws: These draws drain the Pentecost Pasture, and they have no surface water connection with the Tucannon River. These draws are generally vegetated with grasses and forbs. Other ephemeral draws drain into the Snake River. These draws are vegetated, they may

be grazed, and they are separated from the river by at least ½ mile, a state highway, and a railroad.

6.4.2 Pataha Creek (See also subsection 6.2.2)

Within Columbia County, conditions surrounding Pataha Creek provide an example of degraded riparian conditions. The word “Pataha” means brushy creek, and was named for its brushy character by early inhabitants. In 1997, canopy density of Pataha Creek never exceeded 15 percent in the 24 stream miles between its confluence with the Tucannon River and the town of Pomeroy, with reed canary grass as the dominant plant bordering the stream. Areas with the least riparian vegetation are where cropland borders the stream terrace or in areas with highly concentrated livestock use.

Within BLC ownership, Pataha Creek has a deep incised channel through BLC lands. BLC has eliminated grazing and farming from the lands that occur between Highway 12 and Pataha Creek. Trees and shrubs were planted under CREP, and the riparian vegetation is recovering.

Intermittent draws, such as Dry Gulch and Miller Gulch, drain into Pataha Creek. Miller Gulch is incised to meet the lowered elevation of Pataha Creek. Grazing is managed in the Pataha block to maintain grass cover in steep draws, preventing erosion.

6.4.3 Robinson Fork (See also subsection 6.2.12)

Riparian areas in the Robinson Fork have been impacted by the 1996 flood, and also by grazing, streamside roads, and poorly located forest landings and skid trails. To begin to restore the riparian areas, BLC intensified its cattle management, abandoned the “Bottom Road” for logging use; the bottom road will be used for light administrative use. Logging within riparian areas is addressed under the Forest Practices Rules. The prescriptions are complex and site-specific, but in general terms, no timber can be harvested within 75-feet of the waterways. BLC lands also include headwater areas to Robinson Fork. Much of Robinson Fork burned in 2006. Much of the headwaters supported commercially mature timber prior to the fire. Fire salvage harvest is expected in 2006, 2007, and 2008. In 2007 BLC implemented CREP buffers. Cattle will be fenced out of the buffer during the CREP contract period.

6.4.4 Patit Creek (See also subsection 6.2.8)

Block #1: The adjacent land use is irrigated pasture. The channel has downcut and widened; some degree of bank erosion continues. A fence borders Patit Creek on both sides; bed and incised channel are well vegetated. After enrolling the area in CREP, BLC extended the fence width.

Block #2: Riparian vegetation is well developed and banks and beds are stable. The stream is heavily shaded in areas.

Block #3: Some areas have limited bank stability. The south side of the creek includes BLC ownership, and was fenced in 2003 after enrolling in CREP. The north side of the creek is not grazed. Adjacent land is pasture irrigated from wells.

Block #4: A county road parallels the stream on its north side, but is generally well separated from the creek by a richly developed shrub and small deciduous tree riparian zone. BLC grows dryland wheat and peas on flat terraces above the incised channel. In some areas farming occurs to the edge of the channel bank; BLC has modified plowing distance from the creek to allow increased riparian area.

Cougar Canyon, Tributary to West Patit Creek (See also subsection 6.3.9): The riparian area is well developed, and side slopes support pines. Cougar Canyon burned in the 2006 fires, but the riparian area did not burn hot. The tree farms were a total loss.

Patit Creek Intermittent and Ephemeral Tributaries: These channels typically have fully to partially developed shrub and deciduous tree riparian communities, and are often separated from dry croplands by CRP, grazed grasslands, or trees planted by BLC. In particular, trees and grasses are planted by BLC on very steep lands. In one location, an unsurfaced road in highly erodible silty soils parallels an ephemeral channel. The road is used by farm equipment, and occasionally was subject to severe rutting and erosion during heavy seasonal rains. This road was resurfaced by BLC in 2003. Some of the ephemeral side streams in the Patit watershed burned in the 2006 fire. Grass cover in the burned areas should recover quickly.

6.4.5 Touchet River

Intermittent tributaries, such as Whetstone Creek are supported by grass waterways on BLC lands (see also subsection 6.3.7). Some of the ephemeral side streams in Payne Hollow burned in the 2006 fire (see also subsection 6.2.11). Grass cover in the burned areas should recover quickly.

6.5 Stream Channels

Stream channel classification methods are discussed in Appendix 5, and displayed in Figure 2. All streams within and near BLC's lands were classified and mapped.

All of Broughton land ultimately drains into the Snake River through the Tucannon River or the Walla Walla River through the Touchet River. Tributaries of the Tucannon River draining Broughton land include Pataha Creek, Willow Creek, Whetstone Creek, Smith Hollow Creek, and Cougar Canyon Creek. Tributaries of the Touchet River draining Broughton parcels include Patit Creek, Whiskey Creek, Payne Hollow Creek, and the Robinson Fork (Figure 12).

As a result of the loss of riparian vegetation, and in some cases in combination with accelerated runoff, stream channels in some areas have become degraded. These problems have been reported for parts of the Tucannon River (Columbia Conservation District 1997), for Pataha Creek (Pomeroy Conservation District 1997), for the Touchet River (Michaelis 1972; USACE 1997), the North, South, Robinson, and Wolf Forks of the Touchet upstream of Dayton

(Reckendorf and Associates 2000; WDNR 1998), and South Fork Patit Creek (Reckendorf and Associates 2000). Stream channelization and straightening, drainage of wetlands, and conversion of grasslands, shrub communities, and forests to croplands resulted in severe channel downcutting, widening, channel instability, and further loss of native riparian communities.

Today, many streams have re-established riparian communities within flood terraces that have developed adjacent to the streams within these incised channel forms. In other cases, riparian vegetative development continues to be retarded by farming to the stream edge and riparian grazing. Roads located adjacent to streams also adversely affect stream shade and contribute sediment-laden runoff to streams in some areas.

Columbia County has also experienced a series of floods that have repeatedly scoured streambeds, stream banks, and riparian vegetation. Severe floods damaged the Touchet and Tucannon River systems in 1964-65, 1968-69, and again in 1996-97. The Columbia County Conservation District (1997) reports that riparian and channel conditions improved following the 1964 flood, but had not fully recovered when the 1996-97 floods caused further decline. The District reports that following the floods the Tucannon River became wider, less stable, frequency of large pools with large woody debris decreased, and frequency of unvegetated stream banks increased. Similar problems occurred in Pataha Creek (Pomeroy Conservation District 1997) and in the headwater forks of the Touchet River, including the Robinson Fork where BLC owns land (Reckendorf & Associates 2000).

Channel conditions on BLC lands are described in the Photo documentary (Appendix 1), and summarized below, with additional information as referenced. Section 6.2, Description of Individual Parcels and Watersheds, also provides detailed information on the current conditions and management, including channel conditions, within each watershed in the project area.

6.5.1 Tucannon River (See also subsection 6.2.3)

Riparian Area 1 (about 1,500 feet in length near the mouth of Willow Creek): Parts of the Tucannon River stream banks in Area 1 have eroded, and the channel and stream banks are unstable. Efforts have been made to stabilize the channel with rock and log revetments. Some areas have had dikes in the past, and the river has moved its channel.

Riparian Area 2 (about 3,000 feet in length on the north bank, upstream of area 1): The area appears stable and vegetated, as evidenced by photos in Appendix 1.

Riparian Area 4 [Note: photo documentary skips Area 3.]: (about 2 miles in length on the Tucannon River). Fords in this area may be used rarely by cattle in extreme winter weather.

Willow Creek tributary to Tucannon River: This incised channel is stabilized by vegetation. An ephemeral tributary to Willow Creek, Messner Gulch, is a bedrock- and rubble-dominated basalt stream. Smith Hollow Creek varies from well vegetated and stable, to severely downcut and degraded. Downcutting in the downstream section is prevented from progressing upstream by a ledge of basalt bedrock that underlies the channel.

Tributary intermittent streams on BLC lands occur with in steep canyon grass and grazed areas. The vegetated condition helps stabilize these canyons and draws.

Ephemeral draws drain the Pentecost Pasture, and they have no surface water connection with the Tucannon River. These draws are generally vegetated with grasses and forbs. Many ephemeral draws in the Pentecost pasture drain into the Snake River. These draws are stabilized by vegetation, mostly grasses and forbs. Fields Gulch was impacted in areas by erosion of a gravel road prism. A fence separates BLC cattle from the gulch.

6.5.2 Pataha Creek (See also subsection 6.2.2)

Within BLC ownership, Pataha Creek has a deep incised channel through BLC lands. Trees and shrubs were planted under CREP, with the goal to stabilize the floodplain and banks.

Intermittent draws, such as Dry Gulch and Miller Gulch drain into Pataha Creek. Miller Gulch is incised to meet the lowered elevation of Pataha Creek. Grazing is managed in the Pataha Block to maintain grass cover in steep draws to stabilize the draws.

6.5.3 Robinson Fork (See also subsection 6.2.12)

Stream channels in the Robinson Fork have been impacted by the 1996 flood, and also by grazing, streamside roads, and poorly located forest landings and skid trails. To begin to restore the stream stability, BLC intensified their cattle management, and abandoned the “Bottom Road” for logging use; the bottom road will be used for light administrative use. The South Fork Touchet River watershed analysis (WDNR 1998) is applicable to areas of the Robinson Fork downstream from and within BLC ownership. This analysis indicated that problems include low frequency of pools due to lack of large woody debris (LWD) and pool filling by gravels and cobbles. Past road, grazing, and timber management practices, exacerbated by the 1996 flood, have resulted in low near-term LWD recruitment potential (WDNR 1998). The watershed analysis also resulted in additional timber harvest prescriptions to maintain stability in steep or erodable areas.

6.5.4 Patit Creek (See also subsection 6.2.8)

Patit Creek has been subject to the same storms that created the floods and damage experienced by the larger channels in the county. However, the lower reaches of Patit Creek did not experience the degree of channel degradation during the 1996 floods that remain evident in the Touchet River and the Robinson Fork. Reckendorf and Associates (2000) report that South Patit Creek has experienced downcutting, sometimes to bedrock, widening, and extensive stream bank erosion. The mainstem Patit Creek downstream near BLC’s lands has historically experienced these same effects. The channel remains vulnerable to these effects in some areas, while in others, current management and the condition of the riparian area render the channel more resistant to erosion processes.

Block #1: The channel has downcut and widened. The streambed is characterized by stable basalt cobble with few deposits of fines. Pools are rare and shallow. Large woody debris is nearly absent. There are small areas of unstable banks.

Block #2: The streambed and banks are stable.

Block #3: This area was grazed, and cattle caused some disturbance of the bed and banks. Fencing to the south in 2003 should improve this situation.

Block #4: Severe channel downcutting occurred decades ago. The incised stream channel is generally stable, but vertical and barren banks occur in several areas within this reach, likely because these areas were farmed to the edge of the banks.

Cougar Canyon, Tributary to West Patit Creek (See also subsection 6.2.9): The riparian area is well developed, and side slopes support pines. Cougar Canyon burned in the 2006 fires, but the riparian area did not burn hot. The tree farms were a total loss.

Patit Creek Intermittent and Ephemeral Tributaries: Some channels have evidence of downcutting, erosion, and gullyng, although they are stabilized due to recovered vegetation.

6.5.5 Touchet River

Intermittent tributaries, such as Whetstone Creek are supported by grass waterways on BLC lands (see also subsection 6.2.7). Some of the ephemeral side streams in Payne Hollow burned in the 2006 fire. Grass cover in the burned areas should recover quickly.

6.6 Hydrology and Water Quality

The volume and speed of runoff in much of the farmland and pastureland in Columbia County is increased above naturally occurring conditions as a result of historical land use practices. Water temperatures in the streams throughout the county are elevated above naturally occurring levels because of channel conditions and loss of shade resulting from historic agricultural and grazing practices, riparian harvest, road construction, and other uses and development. The water quality conditions, including elevated temperatures, in streams on BLC's lands are similar to those in the rest of the county. Where riparian areas on and adjacent to BLC lands are currently well vegetated, channels and banks are generally stable and well shaded.

Some stream reaches within BLC's lands, particularly along Pataha and Patit Creeks, are not well protected and vegetated, and channel and bank erosion and stream shade/water temperature are problems. During peak flows, water yield and low flow regimes of the Robinson Fork are not measurably different from conditions found under the hypothetical fully forested (natural/unmanaged) condition (WDNR 1998). However, floods in 1996, interacting with then-existing roads and skid trails and the effects of previous riparian harvest, scoured reaches of the Robinson Fork, leaving it in a highly unstable state from which it is now slowly recovering. Water temperatures are elevated above naturally occurring ambient conditions due to channel

conditions, riparian harvest, and loss of shade (WDNR 1998). Riparian and erosion conditions may also have been changed as a result of the Columbia Complex Fires in 2006.

Rates of erosion and sediment delivery to streams from dry crop areas in parts of Columbia County can be extreme. For instance, the Pomeroy Conservation District (1997) reported that for the Pataha Creek watershed in 1986, “over 1,060,000 tons of soil was eroded from cropland fields each year by sheet and rill erosion at an average of 17 tons per acre. Over 177,600 tons of sediment, resulting from erosion, reaches streams” (3.4 tons/acre-year). Although extensive installation of conservation measures between 1986 and 1992 has reduced these rates substantially in much of the county, they remain high in some areas.

BLC irrigates farmland from the Tucannon River and Patit Creek. At the Tucannon River irrigated parcel, BLC has implemented irrigation efficiency measures and protected the saved water instream. Beginning in 2004, BLC protected 6.4 cfs of the saved water instream as “trust water”, out of an 11.15 cfs water right. This water is protected through January 1, 2019.

Heavy grazing and poor practices beginning in the 1860s also caused serious degradation of rangelands in many areas of Columbia County. Again using Pataha Creek as an example of historic conditions, 69 percent of the rangeland was in poor to fair condition in 1986. The 1986 estimate of erosion was ½ ton per acre on the 31 percent of good/excellent rangelands, and 3 tons per acre on the remaining 69 percent of rangelands classed as fair to poor (Pomeroy Conservation District 1997).²⁷

Historic forest management practices have also increased erosion and sediment delivery above natural rates. However, recent estimates of the average rate for all sources of erosion in the forest are 0.4 tons/acre/year, with delivery of 0.03 tons/acre/year (Pomeroy Conservation District 1997). Although these rates are low in comparison to those reported for range and croplands, significant effects of forestland erosion have been reported (Columbia County Conservation District 1997; Reckendorf & Associates 2000).

The federal Clean Water Act requires Ecology to identify water bodies that fail to meet water quality standards. The results are published in the Water Quality Assessment (WQA). The WQA contains both the 303(d) List and the 305(b) Report in a single integrated report. The agency then works with local interests to prepare cleanup plans (also known as TMDLs) to reduce such pollution, establishes conditions in discharge permits and nonpoint-source management plans, and monitors the effectiveness of the cleanup plan. Portions of Robinson Fork are on Ecology’s 303(d) list for temperature. Portions of Pataha Creek and the Tucannon River are on the 303(d) list for temperature, fecal coliform, and/or pH. Portions of the Tucannon River are also listed for temperature, fecal coliform, and in one location for pH. These degraded water quality conditions indicate the need for riparian buffers to act as nutrient buffers, and to provide shade to moderate temperatures.

²⁷ Quantities of sediment delivered to streams from rangelands were not reported in the documents reviewed for this HCP.

6.7 Socioeconomic Conditions

There is a substantial rural component not only in the economy of Columbia County, but also in the lifestyle. Columbia County's economy is predominantly a product of the predominant agricultural land uses. The combination of livestock production, irrigated and non-irrigated farming, and forest management that constitute BLC's operations are reflected throughout the remainder of the county. Of the county's 553,600 acres, 201,000 are cropland, mostly wheat, peas and lentils, barley, and hay. Forests occupy 200,000 acres, while rangelands make up the remaining 152,000 acres. Total value of all agricultural products in the county in 1992 was \$19.7 million. BLC is an important contributor to Columbia County's economy through the production of wheat and other agricultural crops, plus sales of livestock and timber, which generate \$4 million for the company each year. From this revenue, the company employs 10 people on a permanent basis and another 12 seasonally, with a total payroll of approximately \$400,000. In addition, BLC purchases seed, fertilizer, farm chemicals, plus parts and equipment that total \$2.7 million each year. Most of these purchases are made locally.

The County is sparsely populated, with 4,100 people either residing in the community of Dayton (approximately 2,500 people) or in unincorporated or rural areas throughout the county (Palouse Economic Development Council (<http://www.palouse.org/>); Washington State Data Book 2005, QuickFacts, U.S. Census Bureau 2007). Demographic information indicates that the population of Columbia County is about 10.0 percent Hispanic origin, 1.0 percent Native American, less than 1.0 percent black/African-American, less than 1.0 percent Asian, and the balance of the population is white.

Much of the employment in Columbia County is seasonal, rising during the active farming and food processing parts of the year. For example, total permanent employment in the county is 1,640. However, during the summer and fall, Seneca Foods may employ as many as 1,500 seasonal workers, while Bluewood Ski Area typically hires 150 winter seasonal workers. Annual wages totaled \$35.6 million, with a median household income of \$26,500 in 1999. Census data indicate that by 2004, annual total wages increased to \$38.0 million and the median household income increased to \$35,897 in the county, compared to the higher statewide median income of \$48,438. About 12 percent of persons in Columbia County live below the poverty level, whereas the statewide average was 11.6 percent (QuickFacts, U.S. Census Bureau 2007).

6.8 Cultural Resources

Ethnographic background

The BLC property is within the Columbia Plateau cultural area. Ethnographically, the Native Americans who inhabited and utilized the area include the Nez Perce, Umatilla Cayuse, Palus and the Walla Walla Indians (Steward 1938). These tribes lived a semi-nomadic life, subsisting on fish, along with local roots and berries, deer, and elk. They practiced a seasonal subsistence pattern utilizing the resources from the lowlands along the Columbia River to the highlands of the Blue Mountains. The lower elevation of the river drainages were used during the winter months. The tribes established camps along the drainages and they subsisted on local game and dried foods. During the milder months, temporary campsites were established in the uplands

near water and seasonal food resources (Lucas 1996). River valleys served as natural pathways and transportation links for accessing the various resources.

Salmon was both a major food item and an item of trade with other bands. However, when horses reached the Plateau culture from the neighboring Shoshones around A.D. 1730, the style of hunting practices changed to include forays into buffalo country. The arrival of the horse ultimately enabled groups to travel over broader areas (Haines 1938).

Historic background

European-American settlement of the area largely began as a result of the expedition of Lewis and Clark in 1805. In the spring of 1806, the Lewis and Clark expedition traveled through the area and camped near Patit Creek (<http://www.historicdayton.com/lewis.htm>) on what is now a portion of BLC's land holdings. The BLC donated lands where the Lewis and Clark expedition camped, and the local historical society maintains an interpretive site on that location.

Fur trappers, traders and settlers followed, occupying Indian land. Protestant and Catholic clerics also came bringing their religion and schools. As pressure from the settlers and their discontent increased, so did conflict with the local tribes. One of the major battles occurred near what is now Broughton land, near the mouth of Patit Creek at the Touchet River. Treaties brought peace to the settlers and a reservation for the Tribes. Indians were gradually forced on to and restricted to the reservation.

The discovery of gold led to more of a sedentary lifestyle that in turn created a demand for goods and services (Fulgham 1989). Thus, cattle and sheep ranchers took advantage of the market situation and grazing became more important. The Homestead Act of 1862 helped create the setting for additional immigration to the area. (Johnson 1995). The town of Dayton was incorporated in 1874, with a population that approached that of the current town. Dayton and the surrounding area settled into its current quiet farming lifestyle.

This history makes for a potentially rich archaeological resource. The history of European-American settlement is reasonably well documented. On the other hand, with the exception of a rich oral history, there is far less known about the indigenous peoples, especially about their history before the arrival of settlers.

Despite the undoubtedly rich history, BLC's manager reports that, other than the Lewis and Clark campsite, there are few known existing cultural resources within the company's ownership. This is probably a result of natural disturbances such as fires and floods, and the fact that much of the BLC lands have been actively farmed, grazed, and logged for at least a century. According to the BLC manager, the Robinson Fork Block, which has some undisturbed areas, may still have sites and artifacts of historical and archaeological significance.

A review of the cultural resource files located at the Washington Department of Historic Preservation and Archaeology was completed on July 23, 2003, and no cultural resources sites have been previously recorded within the area of potential effect. Twelve sites and one isolated find, however, have been previously recorded within a mile radius of the lands owned by BLC.

The sites include a lithic scatter, rock alignments, rock cairns, rock shelters, historic refuse, a deteriorated cabin, and a trash pit. The isolate is a single lithic flake. These sites are located outside of lands owned and managed by BLC and thus will not be impacted.

The BLC lands have been degraded due to past management activities involving farming, grazing and logging which began in the 1860's. The lowlands have been used for dryland grazing and the uplands, located to the south, have been used for grazing and timber harvesting. The areas between the lowlands and uplands have been used primarily for agriculture.

Based on the archaeological, ethnographical and historical background of the general BLC area, riparian zones, ridge tops, and lowlands are considered to be high probability areas for both prehistoric and historic resources. However, considering the past land use history of the BLC lands and given that the Washington Forest Practice Rules prohibit harvesting in riparian areas, which is also where cultural resources might be present, it is expected that there will be no effects to cultural resources in the APE. The proposed construction of new logging roads in the Robinson Fork drainage, however, will occur on previously undisturbed ground. For this activity, and any other BLC activity that will occur in areas where incidental take might result, Section 106 compliance will be achieved under the Programmatic Agreement among the U.S. Fish and Wildlife Service Region 1, the Advisory Council on Historic Preservation, and the Washington State Historic Preservation Officer.

Chapter 7 Environmental Consequences

7.1 Impacts of the Alternatives

7.1.1 Criteria for Significance

This evaluation assesses whether the proposed activities would have any individual or collectively significant effects on the human environment within Columbia County. Significance is determined by considering intensity and context (40 CFR 1508.27). Intense effects are those that cause impacts to public health; to unique characteristics of the area; to cultural resources or endangered species; are precedent setting; controversial; unique or uncertain; or are those that violate environmental protection laws. In general, context is viewed in relation to sensitivity of the environment. Sensitive environments are those that have little past disturbance, and have intact ecological functions and processes; or are environments that have resources that can easily be impacted by disturbance leading to disruption of ecological functions and processes.

The following natural resources and topics form the basis for the analysis: aquatic and riparian species, riparian conditions, stream channels, hydrology and water quality, socioeconomic conditions, and cultural and historic resources. Under most of the topics below, we separate the environmental consequences discussion into two types of lands: 1) forest lands (including the Robinson Fork Parcel) and 2) farm and grazing lands (all other parcels). A summary of environmental consequences associated with the alternatives is presented in Table 17.

7.1.2 Aquatic and Riparian Species

7.1.2.1 No Action Alternative

Forest Lands

In BLC's forest lands under the No Action Alternative, the riparian and upland management requirements of the Forest Practices Rules would continue. These requirements, and the implementation and maintenance of CREP for the contract period would result in improved riparian habitat conditions for Chinook, middle Columbia steelhead, possible bull trout, lamprey, margined sculpin, interior redband trout, tailed frogs, and other non-aquatic riparian species in the Robinson Fork. No additional voluntary restrictions of harvest within the Robinson Fork riparian area and road management would be implemented.

Fords would continue to be used across Robinson Fork for administrative use, without commitments to check for spawning redds within or downstream of the fords, causing potential impact to middle Columbia steelhead which could spawn in the area.

Grazing would continue in Robinson Fork at the discretion of the applicant, likely beginning in 2008 after the tree seedlings reach an adequate size after the 2006 fire. Riparian habitat and cattle movement monitoring would be voluntary and up to the applicant after the CREP contract ends. Thus, while riparian habitat conditions would likely improve during the CREP contract

period (15 years), improving habitats for aquatic and riparian species, the improvement might or might not continue after the contract period.

In the forest lands, non-aquatic riparian species would be the same or similar to the current condition, with some improvement due to existing management and implementation of CREP buffers, but no guarantee to maintain the riparian buffers in the long term.

Farm and Grazing Lands

In the farming and range areas, BLC would also continue to manage farmland and pasture land riparian areas in the current condition, including maintaining grassed waterways and CRP fields and other erosion control expectations under the Farm Bill, as long as the programs continue. BLC would continue to conserve Tucannon River irrigation water rights instream, through 2019. Specific riparian area fencing and cattle exclusion projects that do not have CREP contracts, may not be implemented, and improvements in channel structure, instream habitat, and stream temperature regimes anticipated may not occur. After the CREP contracts, the applicant may or may not renew them, and may or may not maintain the riparian habitat condition at that time. The decisions would likely depend on farming efficiency (i.e.: is it easy to farm in or closer to riparian areas) and market conditions (i.e.: is the gain worth the extra effort). Thus, habitat for aquatic and riparian species would be the same or similar to the current condition, with some improvement due to existing management and implementation of CREP buffers for the contract period (usually 15 years), but no guarantee to maintain the riparian buffers in the long-term.

In the farm and range areas, implementation of the No Action Alternative is likely to maintain Snake River Steelhead, Snake River spring/summer Chinook, Snake River Fall Chinook, bull trout, and margined sculpin in the existing conditions in the Tucannon River, with current threats remaining. Similarly, Pataha Creek would continue to support migration habitat for the Snake River steelhead; Patit Creek would support middle Columbia River steelhead and redband trout; and Robinson Fork would support middle Columbia River steelhead, possibly bull trout, margined sculpin, Pacific lamprey, and redband trout. No additional measures would be implemented to improve habitat conditions for these species.

In farming, and range areas, non-aquatic riparian species would be the same or similar to the current condition, with some improvement due to existing management and implementation of CREP buffers, but no guarantee to maintain the riparian buffers in the long term.

7.1.2.2 Farm and Range Land Alternative

Forest Lands

Impacts to aquatic and riparian species in forestlands on BLC's Robinson Fork would be the same as would occur under the No Action Alternative because there would be no additional commitments on forestlands with this HCP alternative.

Farm and Grazing Lands

Under this alternative, HCP conservation measures agreed to for lands and streams within farming and grazing lands would be implemented, riparian conditions would improve stream channel and bank stability and morphology, stream shade would increase in Pataha Creek and

Patit Creek, and water temperature regimes would be improved. Buffers established under CREP in and adjacent to farmlands would be maintained for the life of the HCP. More favorable instream habitat and thermal conditions for anadromous and resident aquatic and riparian species would develop, and to the degree that these populations are affected by this habitat, these populations would improve. The habitat improvement on the farming and grazing lands would be greater than that expected for the No Action Alternative, because BLC offers a longer term commitment to maintain CREP and other riparian buffers for the life of the HCP (25 years) rather than just the life of the CREP contract (usually 15 years).

The measures BLC has implemented and plans to implement pursuant to this alternative, such as establishing riparian buffers, improving livestock management, and dedicating saved water to increase stream flows in the Tucannon River are expected to improve habitat conditions for the aquatic and riparian species in the farm lands and range lands for the 25-year life of the HCP. Spring/summer Chinook juveniles, which reside for over a year in fresh water before migrating to sea, are expected to benefit because of incremental instream flow improvements and riparian habitat protection. Fall chinook salmon would benefit primarily from actions that reduce sedimentation to spawning gravels, such as improved riparian buffers, decreased frequency of vehicle fords in rivers. Steelhead would have improved habitat conditions since they are more likely to spawn in the resultant cleaner and cooler water, and bull trout migratory habitat may be improved through resultant cleaner and cooler water from more mature riparian habitats.

Similar to the aquatic species, the non-aquatic riparian species in the farming and grazing lands would be improved due to BLC's commitment to maintain riparian conservation measures for a longer period of time than is offered in the No Action Alternative.

In summary, under the Farm and Range Land Alternative, Snake River Steelhead, Snake River spring/summer Chinook, Snake River Fall Chinook, bull trout, and margined sculpin would continue in the Tucannon River, and potentially improved due to longer term improvements in riparian habitats and aquatic functions than the No Action Alternative. Pataha Creek would continue to support migration habitat for the Snake River steelhead, and improvements from CREP buffers and off-stream cattle grazing would continue for the life of the HCP. Patit Creek would support middle Columbia River steelhead and redband trout, and aquatic habitat would continue to improve due to increased grazing buffers and farming buffers along the creek. Conditions in Robinson Fork, which supports middle Columbia River steelhead, possibly bull trout, margined sculpin, Pacific lamprey, and redband trout, would remain the same as the No Action Alternative.

7.1.2.3 Proposed Action Alternative

Forest Lands

The Forest Practices Rules (WFPB 2001) currently in effect strictly regulate harvest and road management practices within riparian zones. BLC would follow these regulations and in the event that these July, 2001 regulations are modified, BLC would provide and implement equivalent or greater habitat protection to the current requirements. In addition, improved cattle management practices, including removing cattle from Robinson Fork until 2008 and implementing CREP buffers proposed by BLC would improve the riparian vegetation and

channel banks, and help ameliorate the effects of the 2006 fire. After the CREP contract expires within Robinson Fork, BLC agrees to manage cattle to ensure that riparian habitat is maintained, and will coordinate with FWS and NMFS at that time.

Forest road management under the proposed action would be the same as the No Action alternative, with the addition of a commitment to survey for spawning redds before using fords, therefore improving protections for middle Columbia steelhead, the most likely species to spawn in that area.

BLC commitments in the forest lands will result in improved riparian habitat conditions for Chinook, middle Columbia steelhead, possible bull trout, lamprey, margined sculpin, interior redband trout, and tailed frogs in the Robinson Fork. These commitments would last for a longer period than the No Action alternative, since BLC would ensure maintenance of the riparian habitat after the CREP contract ends.

In the forest lands, non-aquatic riparian species would be the same or similar to the current condition, with some improvement due to existing management and implementation of CREP buffers, but no guarantee to maintain the riparian buffers in the long term.

Farm and Grazing Lands

Under this alternative, HCP conservation measures agreed to for lands and streams within farming and grazing lands would be implemented, riparian conditions would improve stream channel and bank stability and morphology, stream shade would increase in Pataha Creek and Patit Creek, and water temperature regimes would be improved. Buffers established under CREP in and adjacent to farmlands would be maintained for the life of the HCP. More favorable instream habitat and thermal conditions for anadromous and resident aquatic and riparian species would develop, and to the degree that these populations are affected by this habitat, these populations would improve. The habitat improvement on the farming and grazing lands would be greater than that expected for the No Action Alternative, because BLC offers a longer term commitment to maintain CREP and other riparian buffers for the life of the HCP (25 years) rather than just the life of the CREP contract (usually 15 years).

The measures BLC has implemented and plans to implement pursuant to this alternative, such as establishing riparian buffers, improving livestock management, and dedicating saved water to increase stream flows in the Tucannon River are expected to improve habitat conditions for the aquatic and riparian species in the farm lands and range lands for the 25-year-life of the HCP. Spring/summer Chinook juveniles, which reside for over a year in fresh water before migrating to sea, are expected to benefit because of incremental instream flow improvements and riparian habitat protection. Fall chinook salmon would benefit primarily from actions that reduce sedimentation to spawning gravels, such as improved riparian buffers, decreased frequency of vehicle fords in rivers. Steelhead would have improved habitat conditions since they are more likely to spawn in the resultant cleaner and cooler water, and bull trout migratory habitat may be improved through resultant cleaner and cooler water from more mature riparian habitats.

Similar to the aquatic species, the non-aquatic riparian species in the farming and grazing lands would be improved due to BLC's commitment to maintain riparian conservation measures for a longer period of time than is offered in the No Action Alternative.

In summary, under the Farm and Range Land Alternative, Snake River Steelhead, Snake River spring/summer Chinook, Snake River Fall Chinook, bull trout, and margined sculpin populations would continue in the Tucannon River, and potentially improve due to longer term improvements in riparian habitats and aquatic functions than the No Action Alternative. Pataha Creek would continue to support migration habitat for the Snake River steelhead, and improvements from CREP buffers and off-stream cattle grazing would continue for the life of the HCP. Patit Creek would support middle Columbia River steelhead and redband trout, and aquatic habitat would continue to improve due to increased grazing buffers and farming buffers along the creek. Conditions in Robinson Fork, which supports middle Columbia River steelhead, possibly bull trout, margined sculpin, Pacific lamprey, and redband trout, would remain the same as the No Action Alternative.

7.1.3 Riparian Conditions

7.1.3.1 No Action Alternative

Forest Lands

Under the No Action Alternative, BLC's forest management practices would remain subject to the Forest Practices Rules, and the basic protections to riparian zones and road and harvest controls would remain in place. CREP buffers would continue for the 15-year contract period in Robinson Fork; prevention of grazing impacts during that time would result in improved riparian habitat, improved shade, improved likelihood of LWD recruitment. After the CREP contract, BLC would make its own decisions on riparian management and cattle management.

Farm and Grazing Lands

In the farming and range areas, BLC would also continue to manage farmland and pasture land riparian areas in the current condition, including maintaining grassed waterways and CRP fields and other erosion control expectations under the Farm Bill, as long as the programs continue. Thus, many of the upland small tributaries, intermittent streams, and ephemeral draws would be maintained in their current vegetated condition. This continues to minimize impacts such as sediment input to the riparian areas on fish-bearing streams.

BLC would continue to conserve Tucannon River irrigation water rights instream, through 2019. Specific riparian area fencing and cattle exclusion projects that do not have CREP contracts (such as plowing buffers on Patit Creek), may not be implemented, and improvements in channel structure, instream habitat, and stream temperature regimes anticipated may not occur. After the existing CREP contracts (on Pataha Creek, Patit Creek, and Tucannon River), the applicant may or may not renew them, and may or may not maintain the riparian habitat condition at that time. The decisions would likely depend on farming efficiency (i.e.: is it easy to farm in or closer to riparian areas) and market conditions (i.e.: is the gain worth the extra effort). Thus, riparian habitat would be the same or similar to the current condition, with some improvement due to existing management and implementation of CREP buffers for the contract period (usually 15 years). There would be no guarantee to maintain the riparian buffers in the long-term.

7.1.3.2 Farm and Range Land Alternative

Forest Lands

Impacts on riparian habitats within BLC's Robinson Fork parcel would be the same as would occur under the No Action Alternative since there would be no change to management within Robinson Fork.

Farm and Grazing Lands

As in the No Action Alternative, in the farming and range areas BLC would also continue to manage farmland and pasture land riparian areas in the current condition, including maintaining grassed waterways and CRP fields and other erosion control expectations under the Farm Bill, as long as the programs continue. Thus, many of the upland small tributaries, intermittent streams, and ephemeral draws would be maintained in their current vegetated condition. This continues to minimize impacts such as sediment input to the riparian areas on fish-bearing streams.

Under this alternative, agreed to HCP conservation measures for lands and streams within farming and grazing lands would be implemented and riparian conditions would improve. Improved riparian habitat also results in improvements in channel structure, instream habitat, and stream temperature regimes. Improved riparian habitat would result in improved stream channel and bank stability and morphology, stream shade would increase in Pataha Creek and Patit Creek, and water temperature regimes would be improved. Buffers established under CREP and prevention of grazing in those buffers in and adjacent to farmlands (such as on Tucannon River, Patit Creek, Pataha Creek) would be maintained for the life of the HCP. The riparian habitat improvement on the farming and grazing lands would be greater than that expected for the No Action Alternative, because BLC offers a longer term commitment to maintain CREP or similar riparian buffers for the life of the HCP (25 years) rather than just the life of the CREP contract (usually 15 years).

7.1.3.3 Proposed Action Alternative

Forest Lands

The Forest Practices Rules (WFPB 2001) currently in effect strictly regulate harvest and road management practices within riparian zones. BLC would follow these regulations and in the event that these July 2001 regulations are modified, BLC would provide and implement equivalent or greater habitat protection to the current requirements. In addition, improved cattle management practices, including removing cattle from Robinson Fork until 2008 and implementing CREP buffers proposed by BLC would improve the riparian vegetation and channel banks, and help ameliorate the effects of the 2006 fire. After the CREP contract expires within Robinson Fork, BLC agrees to manage cattle to ensure that riparian habitat is maintained, and will coordinate with FWS and NMFS at that time.

BLC commitments in the forest lands will result in improved riparian habitat conditions and these commitments would last for a longer period than the No Action alternative, since BLC would ensure maintenance of the riparian habitat after the CREP contract ends.

Farm and Grazing Lands

As in the No Action Alternative, in the farming and range areas BLC would also continue to manage farmland and pasture land riparian areas in the current condition, including maintaining grassed waterways and CRP fields and other erosion control expectations under the Farm Bill, as long as the programs continue. Thus, many of the upland small tributaries, intermittent streams, and ephemeral draws would be maintained in their current vegetated condition. This continues to minimize impacts such as sediment input to the riparian areas on fish-bearing streams.

Under this alternative, HCP conservation measures agreed to for lands and streams within farming and grazing lands would be implemented and riparian conditions would improve. Improved riparian habitat also results in improvements in channel structure, instream habitat, and stream temperature regimes anticipated may not occur. Improved riparian habitat would result in improved stream channel and bank stability and morphology, stream shade would increase in Pataha Creek and Patit Creek, and water temperature regimes would be improved. Buffers established under CREP and prevention of grazing in those buffers in and adjacent to farmlands (such as on Tucannon River, Patit Creek, Pataha Creek) would be maintained for the life of the HCP. The riparian habitat improvement on the farming and grazing lands would be greater than that expected for the No Action Alternative, because BLC offers a longer term commitment to maintain CREP or similar riparian buffers for the life of the HCP (25 years) rather than just the life of the CREP contract (usually 15 years).

7.1.4 Stream Channels

7.1.4.1 No Action Alternative

Forest Lands

Under the No Action Alternative, BLC's forest management practices would remain subject to the Forest Practices Rules, and the basic protections to riparian zones and road and harvest controls would remain in place. Prescriptions developed under DNR's watershed analysis (1998) would also remain in place until reevaluated; these prescriptions include limits on roads and skid trails to minimize the potential for sedimentation and landslides.

The fire of 2006 is likely to result in some sediment transport in Robinson Fork. Stand replacing fires create opportunities for sediment delivery to streams, usually through "pulse" events, such as summer thunderstorms or heavy winter rains, which is exacerbated by the steep terrain around Robinson Fork. Forbs and grasses have recolonized the site and in the winter immediately following the fire, little additional sediment was noted in the stream. However, large storms or rain on snow events may well happen and could cause short-term, "pulse" impacts which are unpreventable. In an attempt to minimize this, during the fire salvage harvest in 2007 and 2008, on steeper slopes BLC will contour fall whips and poles every 50 to 60 vertical feet and seed with grass to minimize erosion. Where available, live trees will be left as seed sources for regeneration. Other areas will be replanted with seedling stock. Pulses of sediment can have a negative impact on stream channels by decreasing structural diversity in the stream.

The CREP buffers would continue for the 15-year contract period in Robinson Fork; prevention of grazing impacts during that time would result in improved riparian habitat, improved shade, improved likelihood of LWD recruitment, and improved sediment capture. These protective rules, prescriptions, and rules should maintain the stream channel in the current condition, with slow improvement in the future. After the CREP contract, BLC would make its own decisions on riparian management and cattle management.

Farm and Grazing Lands

In the farm and range areas, BLC would continue to manage farm and pasture land riparian areas in the current condition, including maintaining grassed waterways and CRP fields and other erosion control expectations under the Farm Bill, as long as the programs continue. Thus, many of the upland small tributaries, intermittent streams, and ephemeral draws would be maintained in their current vegetated condition. This continues to minimize impacts such as sediment input to the riparian areas on fish-bearing streams.

Specific riparian area fencing and cattle exclusion projects that do not have CREP contracts (such as plowing buffers on Patit Creek), may not be implemented, and long term improvements in stream channel structure, instream habitat, and stream temperature regimes anticipated may not occur. After the existing CREP contracts (on Pataha Creek, Patit Creek, and Tucannon River), BLC may or may not renew them, and may or may not maintain the riparian habitat condition at that time. The decisions would likely depend on farming efficiency (i.e.: is it easy to farm in or closer to riparian areas) and market conditions (i.e.: is the gain worth the extra effort). Thus, riparian habitat would be the same or similar to the current condition, with some improvement due to existing management and implementation of CREP buffers for the contract period (usually 15 years). There would be no guarantee to maintain the riparian buffers in the long term, and thus long term stabilization of the stream channel from a mature riparian buffer may not continue.

In addition to fire, flooding is also expected to occur again in the future in both the forested, farming, and grazing lands. Maintaining diverse structures and a natural stream channel condition can dampen the energy of floods, and allow faster recovery of habitats after a flood. CREP buffers will allow improvement of this flood amelioration function, but it's only guaranteed for the duration of the CREP contracts.

7.1.4.2 Farm and Range Land Alternative

Forest Lands

Impacts to stream channel conditions on BLC's Robinson Fork forestlands would be the same as would occur under the No Action Alternative, because there would be no additional commitments on forestlands with this HCP alternative.

Farm and Grazing Lands

As in the No Action Alternative, in the farming and range areas BLC would also continue to manage farmland and pasture land riparian areas in the current condition, including maintaining grassed waterways and CRP fields and other erosion control expectations under the Farm Bill, as long as the programs continue. Thus, many of the upland small tributaries, intermittent streams, and ephemeral draws would be maintained in their current vegetated condition. This continues to minimize impacts such as sediment input to the riparian areas on fish-bearing streams.

Under this alternative, HCP conservation measures agreed to for lands and streams within farming and grazing lands would be implemented and riparian conditions would improve. Improved riparian habitat also results in improvements in channel structure, instream habitat, and stream temperature regimes anticipated may not occur. Improved riparian habitat would result in improved stream channel and bank stability and morphology, stream shade would increase in Pataha Creek and Patit Creek, and water temperature regimes would be improved. Buffers established under CREP and prevention of grazing in those buffers in and adjacent to farmlands (such as on Tucannon River, Patit Creek, Pataha Creek) would be maintained for the life of the HCP. The riparian habitat improvement on the farming and grazing lands would be greater than that expected for the No Action Alternative, because BLC offers a longer term commitment to maintain CREP or similar riparian buffers for the life of the HCP (25 years) rather than just the life of the CREP contract (usually 15 years). Longer duration of growth of riparian areas results in larger vegetation which contributes root structure to stabilize banks, and increases the potential for large woody debris contributions to the stream, further stabilizing stream morphology and allowing development of pools.

In addition to fire, flooding is also expected to occur again in the future in both the forested and farming and grazing lands. Maintaining diverse structures and a natural stream channel condition can dampen the energy of floods, and allow faster recovery of habitats after a flood. CREP buffers will allow improvement of this flood amelioration function, and because the CREP buffers will be maintained for the life of the HCP, the flood control function on the larger streams is greater than the No Action Alternative.

7.1.4.3 Proposed Action Alternative

Forest Lands

As under the No Action Alternative, BLC's forest management practices would remain subject to the Forest Practices Rules, and the basic protections to riparian zones and road and harvest controls would remain in place. The Forest Practices Rules (WFPB 2001) currently in effect strictly regulate harvest and road management practices within riparian zones. BLC would follow these regulations and in the event that these July 2001 regulations are modified, BLC would provide and implement equivalent or greater habitat protection to the current requirements. Prescriptions developed under DNR's watershed analysis (1998) would also remain in place until reevaluated; these prescriptions include limits on roads and skid trails to minimize the potential for sedimentation and landslides. Forest road management under the proposed action would be the same as the No Action alternative.

In addition, improved cattle management practices, including removing cattle from Robinson Fork until 2008 and implementing CREP buffers proposed by BLC would improve the riparian vegetation and channel banks, and help ameliorate the effects of the 2006 fire. After the CREP contract expires within Robinson Fork, BLC agrees to manage cattle to ensure that riparian habitat is maintained, and will coordinate with FWS and NMFS at that time. BLC commitments in the forest lands will result in improved riparian habitat conditions and these commitments would last for a longer period than the No Action alternative, since BLC would ensure maintenance of the riparian habitat after the CREP contract ends.

As in the No Action Alternative, during the fire salvage harvest in 2007 and 2008, on steeper slopes BLC would contour fall whips and poles every 50 to 60 vertical feet and seed with grass to minimize erosion. Where available, live trees will be left as seed sources for regeneration. Other areas will be replanted with seedling stock. Pulses of sediment can have a negative impact on stream channels by decreasing structural diversity in the stream.

Farm and Grazing Lands

As in the No Action Alternative, in the farming and range areas BLC would also continue to manage farmland and pasture land riparian areas in the current condition, including maintaining grassed waterways and CRP fields and other erosion control expectations under the Farm Bill, as long as the programs continue. Thus, many of the upland small tributaries, intermittent streams, and ephemeral draws would be maintained in their current vegetated condition. This continues to minimize impacts such as sediment input to the riparian areas on fish-bearing streams.

Under this alternative, HCP conservation measures agreed to for lands and streams within farming and grazing lands would be implemented and riparian conditions would improve. Improved riparian habitat also results in improvements in channel structure, instream habitat, and stream temperature regimes anticipated may not occur. Improved riparian habitat would result in improved stream channel and bank stability and morphology, stream shade would increase in Pataha Creek and Patit Creek, and water temperature regimes would be improved. Buffers established under CREP and prevention of grazing in those buffers in and adjacent to farmlands (such as on Tucannon River, Patit Creek, Pataha Creek) would be maintained for the life of the HCP. The riparian habitat improvement on the farming and grazing lands would be greater than that expected for the No Action Alternative, because BLC offers a longer term commitment to maintain CREP or similar riparian buffers for the life of the HCP (25 years) rather than just the life of the CREP contract (usually 15 years.) Longer duration of growth of riparian areas results in larger vegetation which contributes root structure to stabilize banks, and increases the potential for large woody debris contributions to the stream, further stabilizing stream morphology and allowing development of pools.

In addition to fire, flooding is also expected to occur again in the future in both the forested and farming and grazing lands. Maintaining diverse structures and a natural stream channel condition can dampen the energy of floods, and allow faster recovery of habitats after a flood. CREP buffers will allow improvement of this flood amelioration function, and because the CREP buffers will be maintained for the life of the HCP, the flood control function on the larger streams is greater than the No Action Alternative.

7.1.5 Hydrology and Water Quality

7.1.5.1 No Action Alternative

Forest lands

Under the No Action Alternative, BLC's forest management practices would remain subject to the Forest Practices Rules, and the basic protections to riparian zones and road and harvest controls would remain in place. Prescriptions developed under DNR's watershed analysis (1998) would also remain in place until reevaluated; these prescriptions include limits on roads and skid trails to minimize the potential for sedimentation into the creek.

The fire of 2006 is likely to result in some sediment transport in Robinson Fork. Stand replacing fires create opportunities for sediment delivery to streams, usually through "pulse" events, such as summer thunderstorms or heavy winter rains, which is exacerbated by the steep terrain around Robinson Fork. Forbs and grasses have recolonized the site and in the winter immediately following the fire, little additional sediment was noted in the stream. However, large storms or rain on snow events may well happen and could cause short-term, "pulse" impacts which are unpreventable. In an attempt to minimize this, during the fire salvage harvest in 2007 and 2008, on steeper slopes BLC will contour fall whips and poles every 50 to 60 vertical feet and seed with grass to minimize erosion. Where available, live trees will be left as seed sources for regeneration. Other areas will be replanted with seedling stock. Pulses of sediment can have a negative impact on water quality by decreasing structural diversity in the stream.

The CREP buffers would continue for the 15 year contract period in Robinson Fork; prevention of grazing impacts during that time would result in improved riparian habitat, improved shade, improved likelihood of LWD recruitment, and improved sediment capture. After the CREP contract, BLC would make its own decisions on riparian management and cattle management.

Farm and Grazing Lands

In the farm and range areas, BLC would also continue to manage farmland and pasture land riparian areas in the current condition, including maintaining grassed waterways and CRP fields and other erosion control expectations under the Farm Bill, as long as the programs continue. Thus, many of the upland small tributaries, intermittent streams, and ephemeral draws would be maintained in their current vegetated condition. This continues to minimize impacts such as sediment input to the riparian areas on fish-bearing streams.

BLC would continue to conserve Tucannon River irrigation water rights instream, through 2019. However, irrigation water would still be removed from the river during low flow periods, and temperatures would likely continue to be high in the river during summer months.

Specific riparian area fencing and cattle exclusion projects that do not have CREP contracts (such as plowing buffers on Patit Creek), may not be implemented, and improvements in channel structure, instream habitat, and stream temperature regimes anticipated may not occur. After the existing CREP contracts (on Pataha Creek, Patit Creek, and Tucannon River), the applicant may or may not renew them, and may or may not maintain the riparian habitat condition at that time.

The decisions would likely depend on farming efficiency (i.e.: is it easy to farm in or closer to riparian areas) and market conditions (i.e.: is the gain worth the extra effort). Thus, riparian habitat would be the same or similar to the current condition, with some improvement due to existing management and implementation of CREP buffers for the contract period (usually 15 years). There would be no guarantee to maintain the riparian buffers in the long term. Riparian habitat assists in preventing nutrient and sediment entry into streams. A recovered riparian area results in increased shading and lowered stream temperatures. Thus, while hydrology and water quality conditions would likely improve during the CREP contract period (15 years), through improved riparian vegetation, the improvement might or might not continue after the contract period.

7.1.5.2 Farm and Range Land Alternative

Forest Lands

Impacts to hydrology and water quality conditions on BLC's Robinson Fork forestlands would be the same as would occur under the No Action Alternative because there are no additional commitments on forestlands with this HCP alternative.

Farm and Grazing Lands

As in the No Action Alternative, in the farming and range areas BLC would continue to manage farmland and pasture land riparian areas in the current condition, including maintaining grassed waterways and CRP fields and other erosion control expectations under the Farm Bill, as long as the programs continue. Thus, many of the upland small tributaries, intermittent streams, and ephemeral draws would be maintained in their current vegetated condition. This continues to minimize impacts such as sediment input to the riparian areas on fish-bearing streams.

BLC would continue to conserve Tucannon River irrigation water rights instream, for the life of the HCP (25 years). While protection of the "trust water" are greater in this alternative than in the No Action alternative, some impacts still remain. Irrigation water would still be removed from the river during low flow periods, and temperatures would likely continue to be high in the river during summer months.

Under this alternative, HCP conservation measures agreed to for lands and streams within farming and grazing lands would be implemented and riparian conditions would improve. Improved riparian habitat would result in improved stream channel and bank stability and morphology, stream shade would increase in Pataha Creek and Patit Creek, and water temperature regimes would be improved. Buffers established under CREP and prevention of grazing in those buffers in and adjacent to farmlands (such as on Tucannon River, Patit Creek, Pataha Creek) would be maintained for the life of the HCP. The riparian habitat improvement on the farming and grazing lands would be greater than that expected for the No Action Alternative, because BLC offers a longer term commitment to maintain CREP or similar riparian buffers for the life of the HCP (25 years) rather than just the life of the CREP contract (usually 15 years). Riparian habitat assists in preventing nutrient and sediment entry into streams. A more mature riparian area results in increased shading and lowered stream temperatures.

7.1.5.3 Proposed Action Alternative

Forest Lands

As under the No Action Alternative, BLC's forest management practices would remain subject to the Forest Practices Rules, and the basic protections to riparian zones and road and harvest controls would remain in place. The Forest Practices Rules (WFPB 2001) currently in effect strictly regulate harvest and road management practices within riparian zones. BLC would follow these regulations and in the event that these July 2001 regulations are modified, BLC would provide and implement equivalent or greater habitat protection to the current requirements. Prescriptions developed under DNR's watershed analysis (1998) would also remain in place until reevaluated; these prescriptions include limits on roads and skid trails to minimize the potential for sedimentation and landslides. Forest road management under the proposed action would be the same as the No Action alternative.

In addition, improved cattle management practices, including removing cattle from Robinson Fork until 2008 and implementing CREP buffers proposed by BLC would improve the riparian vegetation and channel banks, and help ameliorate the effects of the 2006 fire. After the CREP contract expires within Robinson Fork, BLC agrees to manage cattle to ensure that riparian habitat is maintained, and will coordinate with FWS and NMFS at that time. BLC commitments in the forest lands will result in improved riparian habitat conditions and these commitments would last for a longer period than the No Action alternative, since BLC would ensure maintenance of the riparian habitat after the CREP contract ends. Improved riparian habitat results in more shading and decreased stream temperatures.

As in the No Action Alternative, during the fire salvage harvest in 2007 and 2008, on steeper slopes BLC would contour fall whips and poles every 50 to 60 vertical feet and seed with grass to minimize erosion. Where available, live trees will be left as seed sources for regeneration. Other areas will be replanted with seedling stock. Pulses of sediment can have a negative impact on water quality.

Farm and Grazing Lands

As in the No Action Alternative, in the farming and range areas BLC would continue to manage farmland and pasture land riparian areas in the current condition, including maintaining grassed waterways and CRP fields and other erosion control expectations under the Farm Bill, as long as the programs continue. Thus, many of the upland small tributaries, intermittent streams, and ephemeral draws would be maintained in their current vegetated condition. This continues to minimize impacts such as sediment input to the riparian areas on fish-bearing streams.

BLC would continue to conserve Tucannon River irrigation water rights instream, for the life of the HCP (25 years). While protection of the "trust water" are greater in this alternative than in the No Action alternative, some impacts still remain. Irrigation water would still be removed from the river during low flow periods, and temperatures would likely continue to be high in the river during summer months.

Under this alternative, HCP conservation measures agreed to for lands and streams within farming and grazing lands would be implemented and riparian conditions would improve.

Improved riparian habitat would result in improved stream channel and bank stability and morphology, stream shade would increase in Pataha Creek and Patit Creek, and water temperature regimes would be improved. Buffers established under CREP and prevention of grazing in those buffers in and adjacent to farmlands (such as on Tucannon River, Patit Creek, Pataha Creek) would be maintained for the life of the HCP. The riparian habitat improvement on the farming and grazing lands would be greater than that expected for the No Action Alternative, because BLC offers a longer term commitment to maintain CREP or similar riparian buffers for the life of the HCP (25 years) rather than just the life of the CREP contract (usually 15 years.) Riparian habitat assists in preventing nutrient and sediment entry into streams. A more mature riparian area results in increased shading and lowered stream temperatures.

7.1.6 Socioeconomic Values

7.1.6.1 Impact on Minority and Low Income Persons or Populations

On February 11, 1994, President Clinton issued the Executive Order (EO) on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898). The order requires Federal agencies to make environmental justice part of their mission and to identify and address disproportionately high and adverse human health and environmental effects of Federal programs, policies, and activities on minority and low-income persons and populations. The Environmental Protection Agency working with the Enforcement Subcommittee of the National Environmental Justice Advisory Council has developed technical guidance for conducting environmental justice assessments. Much of this guidance is concerned with identifying low income and minority populations based on the location of the proposed action. Suggested measures include identifying areas as low income if more than 20 percent of the affected area is below poverty level or identifying areas as minority areas if minority populations represent more than 15.72 percent of the total population.

Using this approach, the activities covered by BLC's HCP and its alternatives were evaluated for their impact on the human environment and compliance with EO 12898 to ensure environmental justice. The proposed activities under the proposed action would not pose significant risks to human health or their environment. While there are some low-income and minority persons living in Columbia County, Washington (QuickFacts, U.S Census Bureau 2007), none of the activities under any of the alternatives would result in any adverse or disproportionate environmental impacts to minority or low income persons or populations. There would be little or no change to BLC's management of its activities under the proposed HCP or the alternatives. BLC employs 10 people on a permanent basis and another 12 people on a seasonal basis, or a total of 22 persons annually, which is about one-half of 1 percent of the total population of Columbia County and less than 5 percent of persons living below the poverty level in the County. It is not anticipated that implementation of any of the alternatives would increase or decrease the number individuals employed permanently or seasonally by BLC and result in an adverse or disproportionate impact to minority or low income persons or populations.

7.1.7 Cultural Resources

7.1.7.1 No-Action Alternative

With the No-Action Alternative, BLC's activities would continue at will. With the exception of the upper portions of Robinson Fork, BLC's lands have been continually managed for well over 100 years. BLC does not anticipate any large-scale conversions of its land uses that would necessitate large scale clearing of land or soil disturbance. Any impacts on cultural and historic resources of continuing this management would be negligible, except possibly on the upper portions of Robinson Fork. The potential impacts there are unknown, although BLC would follow FPA rules regarding cultural sites (See subsection 2.5, Relationship to Other Plans, Policies, and Laws).

7.1.7.2 Farm and Range Land Alternative

This alternative does not change actions in Robinson Fork. Forest lands remain the same as the No Action alternative.

Issuance of an ITP would change management on the portions of BLC's farming operations that might disturb cultural resources. If cultural resources are located during project implementation, BLC would cease operations and notify a qualified archaeologist to evaluate the site. As a result, future management of the site might be changed. The BLC's lands have been managed and altered for more than a hundred years, and there is little of the farming and grazing land that is undisturbed. The activities under the Farm and Range Land alternative would not have the potential for more disturbances to cultural resources than under the No-Action Alternative and possibly less, since riparian areas will receive greater protections and these often have a higher likelihood of archeological sites.

This alternative does not change actions in Robinson Fork, and impacts would be the same as under the No Action Alternative.

7.1.7.3 Proposed Action

Within the forest lands, BLC proposes new logging roads in the southernmost portion of the Robinson Fork drainage. In the near term, this would include approximately 1 mile of permanent new road (see Figure 1 in HCP) and accompanying skid trails needed for logging. The addition to the permanent road system would require significant excavation, with a road prism that is approximately 16 feet wide at the base. Skid trails will involve considerably less earthmoving, generally limited to a blade width, and only where necessary to allow crawler tractors or rubber-tired skidders to bring logs to the decks where they are loaded on trucks.

BLC will comply with NHPA by working with archaeologists from the FWS to survey the area indicated in Figure 1 where the new roads would be constructed. BLC will notify the FWS at least 60 days prior to the initiation of either the new roads in Robinson Fork or any other currently unanticipated excavation of areas previously not disturbed. In addition, if other BLC operations uncover what the company personnel view as an artifact or site of potential historic or

cultural significance, BLC will take immediate steps to protect the site and work with the appropriate state and federal agencies to protect these cultural resources. These steps would include a cessation of any ground disturbing activities until a qualified archaeologist has assessed the site.

The BLC's lands have been managed and altered for more than a hundred years and there is little outside of the Robinson Fork that has not been previously disturbed.

7.2 Summary of Impacts

Generally, since BLC has implemented many conservation measures in the project area, the action alternatives would not have a large change on any of the analyzed resources. Expected adverse and beneficial impacts would be small relative to the affected environment. A summary of impacts under each alternative is provided in Table 17.



Elk using BLC lands

Table 17. Summary of Impacts Under Each Alternative

Impact Summary	No Action Alternative	Farm and Range Land Alternative	Proposed Action Alternative
Aquatic and Riparian Species	<p>Forest Lands: Follow Forest Practices Rules and implement CREP on Robinson Fork. no guarantees to continue trend after existing CREP contracts. Resulting in improved riparian habitat for 15 year duration of CREP, no guarantee after.</p> <p>Farming and grazing lands: No change from existing conditions and trend. Riparian and Aquatic species maintained; slow improvement for these species from existing aquatic conditions and riparian improvement during duration of CREP</p>	<p>Forest Lands and Robinson Fork- no change from no action;</p> <p>Farming and grazing lands: Improved riparian habitat and aquatic functions for Tucannon River, Pataha Creek, and Patit Creek species, including spring/summer and fall run chinook, steelhead, and bull trout. Due to trust water increasing flow, the exclusion of livestock and implementation of riparian buffers</p>	<p>Forest lands and Robinson Fork: follow Forest Practice Regs with commitment to maintain those or better practices for the life of the HCP; implement CREP contract; after CREP revisit grazing management; all resulting in improved riparian habitat and aquatic functions for Robinson Fork species.</p> <p>Farming and grazing lands: Improved riparian habitat and aquatic functions for conditions for Tucannon River, Pataha Creek, and Patit Creek species, including spring/summer and fall run chinook, steelhead, and bull trout. Due to trust water increasing flow, the exclusion of livestock and implementation of riparian buffers</p>
Riparian Conditions	<p>Forest Lands: Follow Forest Practices Rules and implement CREP on Robinson Fork. no guarantees to continue trend after existing CREP contracts. Resulting in improved riparian habitat for 15 year duration of CREP, no guarantee after.</p> <p>Farming and grazing lands: No change from existing conditions and trend. Riparian habitats improved during duration of CREP. No guarantees to continue trend after existing CREP contracts</p>	<p>Forest Lands and Robinson Fork- no change from no action;</p> <p>Farming and grazing lands: Improved riparian habitat and aquatic functions for Tucannon River, Pataha Creek, and Patit Creek. Improved habitat conditions resulting primarily from the exclusion of livestock from the riparian zones and streams, and implementation of riparian buffers in farmed areas. CREP would be maintained for life of HCP, allowing longer time for riparian habitats to mature</p>	<p>Forest lands and Robinson Fork: follow Forest Practice Regs with commitment to maintain those or better practices for the life of the HCP; implement CREP contract; after CREP revisit grazing management; all resulting in improved riparian habitat for Robinson Fork.</p> <p>Farming and grazing lands: Improved riparian habitat and aquatic functions for Tucannon River, Pataha Creek, and Patit Creek. Improved habitat conditions resulting primarily from the exclusion of livestock from the riparian zones and</p>

Impact Summary	No Action Alternative	Farm and Range Land Alternative	Proposed Action Alternative
Riparian Conditions con't			streams, and implementation of riparian buffers in farmed areas. CREP would be maintained for life of HCP, allowing longer time for riparian habitats to mature
Stream Channels	<p>Forest Lands: Follow Forest Practices Rules and implement CREP on Robinson Fork. Implement DNR prescriptions for unstable slopes. Should maintain slope stability and riparian habitats to increase channel stability. No guarantee on riparian protections beyond Forest Practices Rules after CREP contract ends.</p> <p>Farming and grazing lands: No change from existing conditions and trend. Riparian habitats improved during duration of CREP should contribute to stream channel stability and functions. No guarantees to continue trend after existing CREP contracts</p>	<p>Forest Lands and Robinson Fork- no change from no action;</p> <p>Farming and grazing lands: Improved riparian habitat and aquatic functions for Tucannon River, Pataha Creek, and Patit Creek. Improved habitat conditions resulting primarily from the exclusion of livestock from the riparian zones and streams, and implementation of riparian buffers in farmed areas; these measures and CREP buffers would be maintained for life of HCP, allowing longer time for riparian habitats to mature. More mature riparian habitats result in more stable and restored stream channel conditions</p>	<p>Forest lands and Robinson Fork: follow Forest Practice Regs with commitment to maintain those or better practices for the life of the HCP; implement CREP contract; after CREP revisit grazing management; all resulting in improved riparian habitat for Robinson Fork.</p> <p>Farming and grazing lands: Improved riparian habitat and aquatic functions for Tucannon River, Pataha Creek, and Patit Creek. Improved habitat conditions resulting primarily from the exclusion of livestock from the riparian zones and streams, and implementation of riparian buffers in farmed areas; these measures and CREP buffers would be maintained for life of HCP, allowing longer time for riparian habitats to mature. More mature riparian habitats result in more stable and restored stream channel conditions.</p>
Hydrology and Water Quality	<p>Forest Lands: Follow Forest Practices Rules and implement CREP on Robinson Fork. Implement DNR prescriptions for unstable slopes. Should maintain slope stability and decrease risk of erosion</p>	<p>Forest Lands and Robinson Fork- no change from no action;</p> <p>Farming and grazing lands: Improved riparian habitat and aquatic functions for Tucannon River, Pataha Creek, and Patit Creek</p>	<p>Forest lands and Robinson Fork: follow Forest Practice Regs with commitment to maintain those or better practices for the life of the HCP; implement CREP contract; after CREP revisit grazing management; all resulting</p>

Impact Summary	No Action Alternative	Farm and Range Land Alternative	Proposed Action Alternative
Hydrology and Water Quality con't	<p>Maybe pulse of increased sediment from 2006 fire until upland grasses mature. No guarantee on riparian protections beyond Forest Practices Rules after CREP contract ends.</p> <p>Farming and grazing lands: No change from existing conditions and trend, will implement grassed waterways under Farm Bill as long as program lasts. Riparian habitats improved during duration of CREP should act as chemical and nutrient buffers, but no guarantees to continue trend after existing CREP contracts</p>	<p>Improved habitat conditions resulting primarily from the exclusion of livestock from the riparian zones and streams, and implementation of riparian buffers in farmed areas; these measures and CREP buffers would be maintained for life of HCP. Riparian buffers act as chemical nutrient buffers. More mature buffers have higher shading effects, improve stream water temperatures. Instream flows improve hydrology in Tucannon River from Trust Water Right</p>	<p>in improved riparian habitat for Robinson Fork. Riparian habitats. Mature riparian habitats result in increased shade and more stable slopes, resulting in less sediment and decreased stream temperatures.</p> <p>Farming and grazing lands: Improved riparian habitat and aquatic functions for Tucannon River, Pataha Creek, and Patit Creek. Improved habitat conditions resulting primarily from the exclusion of livestock from the riparian zones and streams, and implementation of riparian buffers in farmed areas; these measures and CREP buffers would be maintained for life of HCP. Riparian buffers act as chemical nutrient buffers. More mature buffers have higher shading effects, improve stream water temperatures. Instream flows improve hydrology in Tucannon River from Trust Water Right</p>
Socioeconomic Values	No change from existing conditions	No change from existing conditions	No change from existing conditions
Cultural Resources	<p>Possible disturbance of unknown sites in Robinson Fork</p> <p>No change from existing conditions in the farming and grazing lands because currently known or unknown cultural sites would be unlikely to be disturbed</p>	<p>Possible disturbance of unknown sites in Robinson Fork.</p> <p>No change from existing conditions because currently known or unknown cultural sites in farming and grazing lands would be unlikely to be disturbed</p>	<p>Archaeologist will review new road site in Robinson Fork. Any sites found in the Robinson Fork would be evaluated by an archaeologist before disturbance.</p> <p>No change from existing conditions in the farming and grazing lands because currently known or unknown cultural sites would be unlikely to be disturbed</p>

Impact Summary	No Action Alternative	Farm and Range Land Alternative	Proposed Action Alternative
Cumulative Impacts	No predictable change to current management or economic conditions in the area	No predictable change to current management or economic conditions in the area	No predictable change to current management or economic conditions in the area

7.3 Cumulative Impacts

Cumulative impacts are those impacts that result from past, present, or reasonably foreseeable projects that can result from individually minor actions that take place over time and/or space that together may be collectively significant.

For any given year, the impacts of normal BLC farm, forest, or range management to aquatic systems would be minimal. However, when coupled with stochastic events (e.g., fires, floods, landslides) that do produce significant impacts in a single year, the pulse impacts of land uses such as BLC's can accumulate over time or space. It is therefore appropriate to review the actions that have already served to reduce the cumulative impacts of BLC's land uses. They are important, if only to place the current and proposed practices into a useful context.

BLC's lands, generally under earlier owners, were undoubtedly managed no differently from surrounding lands and from the intellectual, cultural, and economic parameters to which all landowners in the Columbia Basin responded. By today's standards, land management earlier in this century was relatively abusive. It is likely that for at least the first half of the twentieth century, all arable land was cultivated every year, riparian areas were left unfenced as a source of water for livestock, and logs were skidded or flushed down the streams simply because it was easier in the days before heavy machinery. These practices resulted in impacts to stream and riparian habitats and to covered species that in some cases were quite severe.

The latter half of the twentieth century, particularly the last 25 years, saw changes, which, while they may not have always been the result of conscious decisions to protect fish and wildlife habitat, had the same effect. For example, energy costs helped promote no-till cultivation and improved irrigation practices, with the attendant benefits of reduced soil loss. Other changes were clearly the result of public support for improved conservation measures, such as Washington's Forest Practices Rules and various changes in farm programs that supported conservation over increased agricultural production.

The consequence of this is that BLC and other landowners now operate in a way that minimizes continual and cumulative impacts to watersheds and aquatic habitats. The proposed HCP outlines some actions that can be implemented to improve conditions in the project area and vicinity. There would be beneficial changes, as Table 18 indicates, however, these changes are difficult to quantify on an annual basis, and relatively slight even over a number of years.

As aquatic and salmonid recovery efforts continue in southeast Washington, there may be more programs and opportunities to improve habitats or monitoring for listed species. More funding and cooperative efforts may be available through Subbasin Planning efforts or Washington's Salmon Recovery Planning, or through NRCS or Farm Bill Programs (See subsection 2.5, Relationship to Other Plans, Policies, and Laws). If these programs are practicable from an economic and stewardship perspective, BLC may implement such programs, with the likely result of adding to positive cumulative benefits to project area habitats and listed species.

Columbia County is not densely populated. However, urban and suburban development pressures may increase in the future. If this type of conversion occurs, management on BLC's

large land holdings would play a vital role in efforts to conserve aquatic habitats, salmonids, and other aquatic species.

Chapter 8 List of HCP and EA Preparers

Joseph M. Hinson is a 1971 graduate of West Virginia University (B.S. Forest Management). He has worked as a forest manager in the southeast and served as the Manager of Private Forestry Programs for the National Forest Products Association in Washington, D.C. (1977-1982). From 1982 until the end of 1997, he was Executive Vice President of the Intermountain Forest Industry Association. He is now a member of the Northwest Natural Resource Group, LLC, specializing in natural resource policy issues.

Dale J. McGreer, P.G., is a 1972 graduate of Humboldt State University (B.S. Forest Management) and a 1974 graduate of Oregon State University (Forest Engineering Hydrology), and is a Washington State licensed Geologist, Engineering Geologist, and Hydrogeologist. He has worked for 31 years as a Forest Hydrologist and Land Manager for the Weyerhaeuser Company in western Oregon and Washington, the Potlatch Corporation in Idaho, and throughout the western United States and Alaska as a consultant.

Dan McKinley is a 1979 Graduate from Washington State University (B.S. Agronomy). He was Crop Consultant and Manager for the McGregor Company for 19 years and is now the General Manager of the Broughton Land Company. He is a Certified Professional Agronomist and a Certified Crop Advisor.

Dennis T. Schult holds a Bachelor's Degree in physics from the University of Minnesota and Master's Degrees in both forest engineering and physics from the University of Washington. Prior to completing his degree in forest engineering, he worked for the Boeing Corporation as a physicist in materials testing. His natural resource experience includes various projects on the relationship of land uses to water quality and quantity for both Potlatch Corporation and as a consultant for Western Watershed Analysts.

Bruce M. Smith is a former wildlife biologist for the Forest Service on the Targhee National Forest. He has Bachelor Degrees from Auburn University in Wildlife Management and in accounting. He completed a Law Degree at the University of Idaho and is now a partner in Moore, Smith, Buxton, and Turcke in Boise, where he specializes in natural resource and water law.

Gregory Carson has a degree in geology from the University of Idaho and is the owner of "Resource Analytics," a full-service GIS analytical firm in Boise. His specific expertise is in developing forest stand data; photo interpretation of vegetative communities; map production and analysis for the purpose of mine site remediation; map production and analyses for watershed assessments. His clients include: U.S. Forest Service, Natural Resource Conservation Service, Idaho Department of Fish and Game, Boise Cascade Corp., Ecosystem Management Research Institute, Washington Water & Power, and Owyhee Watershed Council.

Chapter 9 Agencies, Organizations, and Persons Consulted/Contacted

Affiliation	Name	Date Contacted	Type of Review
WDFW, Area Habitat Biologist	Tom Schirm	January 8, 2001 Various dates	Comments from WDFW on early draft HCP, attended field trips, provided feedback on fish use in area
Confederated Tribes of the Umatilla Indian Reservation (CTUIR), Policy Analyst	Terry Shepherd	July 11, 2001	FWS E-mail to policy analyst providing draft of HCP
CTUIR, chairman, Board of Trustees	Antone Minthorn	July 23, 2001	FWS letter to tribe, informing of availability of draft HCP, and offering to meet
CTUIR, chairman & policy analyst	Antone Minthorn; Terry Shepherd	August 21, 2001	FWS, NMFS, applicant, consultants met with tribe to provide overview of HCP
CTUIR, fisheries	Jed Volkman	8-15-05; 8-18-07	FWS E-mailed draft of HCP Volkman provided general positive comments via email
CTUIR, Policy Analyst	Matt Clark	February 20, 2004	Telephone conversation, FWS sent draft HCP via email
CTUIR, chairman, Board of Trustees	Antone Minthorn	September 30, 2005	FWS letter to chairman updating on HCP status; draft HCP enclosed
Nez Perce Tribe, Chairman Tribal Executive Committee	Samual N. Penney	July 24, 2001	FWS letter to chairman, informing of availability of draft HCP, and offering to meet (no response received)
Nez Perce Tribe, Chairman Tribal Executive Committee	Rebecca Miles	September 19, 2005	FWS letter to chairman updating on HCP status; draft HCP enclosed (no response received)

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